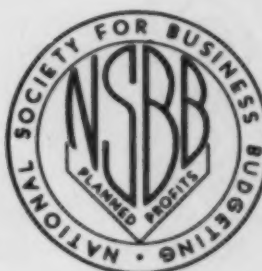


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SWAN SONG

This issue of Business Budgeting represents the final issue put out under the jurisdiction of the 1955-56 N.S.B.B. administration. The list of officers and directors in the column to the left undergoes a change, starting with the next (August) issue of this magazine. The retiring officers take this opportunity to express to one and all their appreciation for the fine assistance received, which made the past year such a success. And the staff of Business Budgeting congratulates the officers, headed by president E. G. (Buck) Mauck, for an outstanding term at the helm.

THE LEARNING CURVE THEORY APPLIED TO PRODUCTION COSTS

By: Robert H. Lundberg

Chief Industrial Engineer, Chance Vought Aircraft Inc., Dallas, Texas

Developed as a means of studying and controlling the high percentage of direct labor in the aircraft industry, the Learning Curve Theory has application in any production-type industry. An understandable presentation of a difficult subject, with plenty of food for thought for many a budget director.

Aircraft costs, like the cost of many other manufactured articles, are to a great degree determined by the magnitude of the direct labor hours required to manufacture the article. Not only are direct labor costs a substantial portion of the total cost, but also they are directly responsible for incurring a major portion of overhead expense. Direct labor cost, together with the overhead expense it controls, accounts for the major portion of aircraft cost. Since this is true, most particular attention is directed to its control.

An extensive study of aircraft production in many companies throughout the country established some definite patterns for time reduction of direct labor. This study was started by T. P. Wright as early as 1922 and presented to the aircraft industry as a theory in 1936. During World War II, this theory was applied as a tool by the War Production Board to measure and compare the production efficiencies of aircraft plants. This application fairly well established the "80% curve" as being average performance for the aircraft industry. In addition, this application brought to light some interesting behavior patterns of direct labor variations as discussed in this article.

Learning Curve Key to Labor Costs

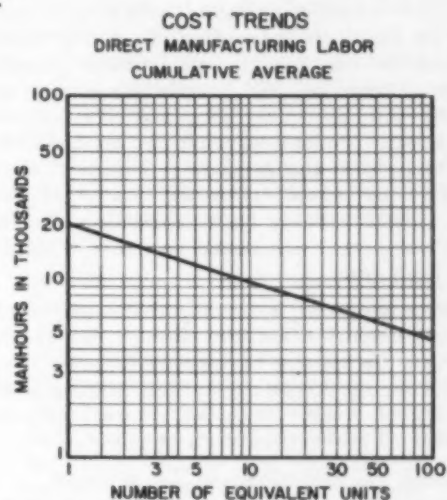
While Learning Curves have been established based on aircraft production, the principles controlling them are common with any "custom-made" production, medium quantity production or even mass production itself. Indeed, a knowledge of the factors influencing Learning Curves is the key to understanding Production Labor Costs.

When a series of cumulative average production labor costs of a particular product is plotted on linear graph paper against the number of articles produced, a curve results which is similar to that shown in Figure 1. This curve is hyperbolic in shape and when plotted on logarithmic graph paper, approximates a straight line as shown in Figure 2. For all practical purposes this curve may be considered as a straight line over the normal range of aircraft production quantities. Since this curve is considered to be a straight line on logarithmic paper, its equation is of the general form $y = bx^m$. The mathematics of this curve will be discussed later on.

(Figure I and II)



TYPICAL 80% LEARNING CURVE
RECTANGULAR GRAPH PAPER



The most impressive features of this Learning Curve are the very high initial cost and rapid rate of reduction in the early portion, with a gradual tapering off in the latter portion, until a fairly stable condition exists. There are quite a number of factors which cause this behavior pattern. For the sake of convenience, we may divide them into two groups: (1) Those which are due to certain conditions that the quantity of units produced permits, and (2) Those which are due to normal improvement which are made in cost performance during the production of any given quantity.

By way of investigating these reasons, consider for the moment the article whose production cost performance establishes the curve. That article has designed into it a certain complexity and a certain number of things which must be done by some combination of men, tools, and machines to produce it.

Relationship of Work Allocation

The relationship of work allocation between men, tools, and machines can be varied within a wide latitude for any given quantity to be produced. Generally, increased tooling reduces the man-hours of work. However, increased tooling also requires a sizeable initial cost, which must be prorated over the articles produced. If there are but a few articles produced, the savings in labor cost most frequently does not offset the increase in total cost.

A similar situation is involved as high quantity production is approached and special purpose machines are considered to replace tooling and further reduce manpower requirements. Obviously, costs cannot be controlled without some degree of administration in the way of planning and scheduling. Here again, the matter of degree is important. It is possible through planning to predetermine the minimum cost for which a certain operation can be performed and through further planning and scheduling, assure that it will be attained.

This is a very involved and very expensive procedure for even the simplest part and can be done economically only for very large quantities. The minimum quantity warranting such action is a function of the complexity of the article, its ultimate intended cost and the time permitted for such planning and scheduling. As the

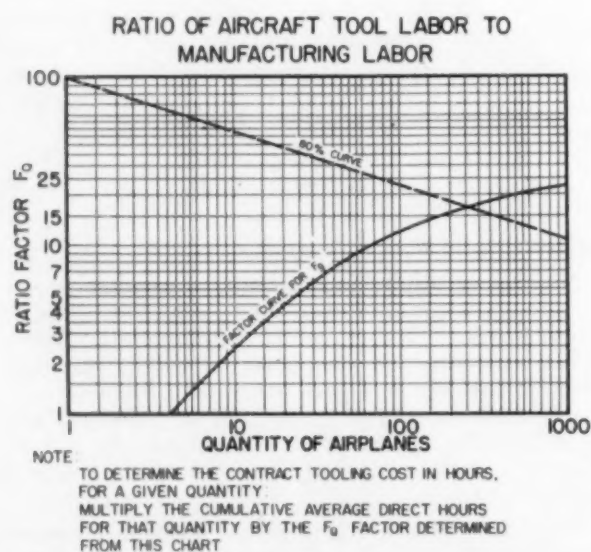
quantity decreases, the complexity increases and/or the time permitted for such planning and scheduling decreases, a more general approach is necessary. As a result, the work performed by men becomes more complex and costly. Further, without a rigid cost control, higher cost is certain to occur.

In the case of small quantity production, we have only a few articles to bear tooling and administrative costs. To keep our cost from becoming excessive, we must restrict our tooling and master planning to the minimum. Therefore, the complexity of the article must be coped with by shop labor and a substantial portion of the actual production must be accomplished by men rather than tools and machines. Further, since it is not economical to master plan and put rigid controls into effect, inefficiencies of production labor, tooling, machine use, etc., are bound to occur, thus resulting in a fairly high cost.

On the other hand, assuming the delivery schedule for the first production article permits, as the quantity of articles to be produced increases more tools can be employed during production which affects a reduction in complexity of work performed, as well as a reduction in the amount of production labor required.

As more master planning is allowed, a system of controls may be developed to assure better efficiency in the use of labor, materials, machine, tools, work routing, and so on, thus effecting a further reduction in cost. The approximate curve for the ratio of master planning cost to average labor cost per unit has a trend similar to that shown on Figure 3, but of course has a lower ratio value.

Fig. 3



As illustrated, the quantity of articles to be produced is one of the main factors in determining the shape of the Progress Curve for labor cost vs. quantity, by controlling the amount of effort and means that may be employed to reduce complexity and place the production burden on machines and tools rather than men.

It is well known that cost performance may always be improved during the production of any given quantity of articles. In the case of a very large quantity, this improvement may be slight over the entire production, while on a small or medium quantity, the reduction of cost may be very noticeable in early production, and gradually taper off until a stable cost is attained. In any case, this reduction is due to learning which takes place

during production and involves the improvement of job knowledge by shop personnel, improvement in manpower allocations by management, design changes, corrections of tools, improvement of shop methods and a general adjustment which takes place throughout the organization. Thus, it becomes evident that the amount of learning which takes place during the production of the article also has controlling influence on the shape of the Learning Curve for labor cost vs. quantity.

Fig. 4

LEARNING CURVES

TABLE OF EXPONENTS, SLOPES AND FACTORS
FOR CUMULATIVE AVERAGE AND UNIT COST CURVES

PERCENTAGE OF CURVE	EXPONENT m	SLOPE IN DEGREES	FACTOR F
50	- 1.000	45°	0.000
55	- .851	40° 30'	.149
60	- .737	36° 0'	.263
61	- .713	35° 6'	.287
62	- .689	34° 12'	.311
63	- .666	33° 18'	.334
64	- .643	32° 24'	.357
65	- .621	31° 30'	.379
66	- .599	31° 30'	.379
67	- .577	29° 42'	.423
68	- .556	28° 48'	.444
69	- .535	27° 54'	.465
70	- .514	27° 0'	.486
71	- .494	26° 6'	.506
72	- .474	25° 12'	.526
73	- .454	24° 18'	.546
74	- .434	23° 24'	.566
75	- .415	22° 30'	.585
76	- .395	21° 36'	.605
77	- .376	20° 42'	.624
78	- .358	19° 48'	.642
79	- .340	18° 54'	.660
80	- .322	18° 0'	.678
81	- .304	17° 6'	.696
82	- .286	16° 12'	.714
83	- .269	15° 18'	.731
84	- .251	14° 24'	.749
85	- .234	13° 30'	.766
86	- .217	12° 36'	.783
87	- .201	11° 42'	.799
88	- .184	10° 48'	.816
89	- .168	9° 54'	.832
90	- .152	9° 0'	.848
91	- .136	8° 6'	.864
92	- .120	7° 12'	.880
93	- .105	6° 18'	.895
94	- .089	5° 24'	.911
95	- .074	4° 30'	.926

GENERAL FORM OF EQUATION $y = bx^m$

SLOPE FORMULA $m = 3.32 \log \% / 100$

UNIT COST FACTOR $F = (1 + m)$

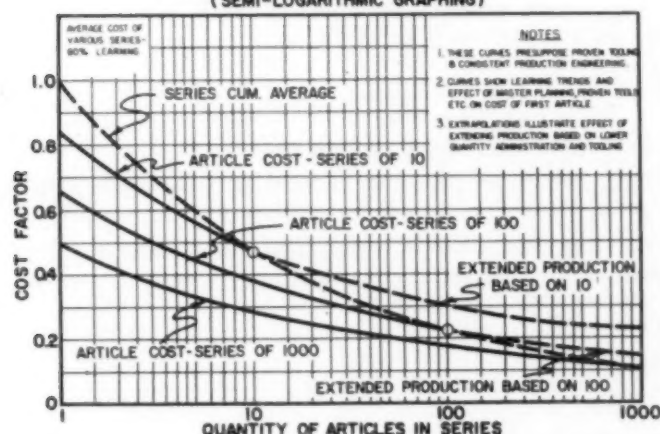
Figure 5 shows a series of curves approximating the effect of learning on the cost of successive units for production runs of various quantities of aircraft. Because of the difficulty in securing sufficient reliable cost information necessary to prove these curves, they should

be considered only as showing the trends of cost. The curves of Figure 5 show cost trends for individual quantities under the following conditions:

1. Production engineering and operational planning is consistent with the quantity involved.
2. Proven tooling is available based on curve of Figure 3.
3. Manpower and work flow is scheduled in accordance with the curve.
4. The turnover of shop is stabilized so production personnel may become familiar with their work by repetition and relearning is held to a minimum.

If the above conditions are not met in small production runs, the initial cost will continue at a rate and for a time dependent on the amount of deviation. Only after corrections and adjustments are made will the costs begin to be reduced according to the applicable rate. In the case of mass production, such deviation will invariably cause an appreciable increase in the early costs as well. Corrections will cause cost reductions at an increased rate until the proper rate is approached and a levelling off occurs. Deviation from these basic principles during intermediate production runs may cause a combination of the above condition and results.

Fig. 5
LEARNING CURVES
COST OF SUCCESSIVE ARTICLES IN A SERIES
(SEMI-LOGARITHMIC GRAPHING)



In the case of aircraft production, generally the time between the receipt of contract and delivery of the first article does not permit a complete production engineering and planning treatment. Frequently, it becomes necessary to begin production with a minimum of tooling and supplement this program with more production tools. The importance of meeting the delivery schedule for succeeding articles and coping with design changes makes it difficult to schedule manpower and work flow and to stabilize shop labor. As a result, the Learning Curves showing the average cost of succeeding units of a given contract instead of following the patterns of Figure 5, approach the pattern for the Learning Curve for aircraft contracts of various quantities as shown by the dotted line on Figure 5, which is the same curve as that shown on Figure 1.

When aircraft production proceeds as discussed above, and the cumulative average direct manufacturing labor costs are plotted against the corresponding unit numbers, as Figure 1, a definite pattern is observed. This pattern is about the same for all aircraft, and is the basis for the theory of the 80% Learning Curve which states, "each time the quantity of the planes is doubled, the

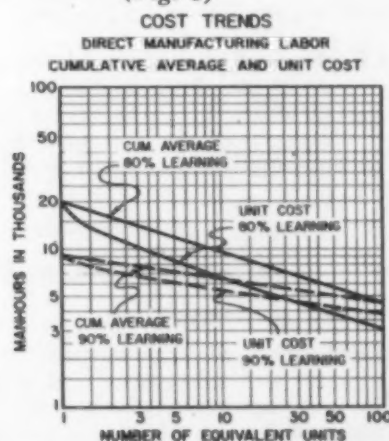
cumulative average cost will be 80% of the cumulative average cost at the quantity which was doubled."

Thus, if the first ten aircraft were produced for an average cost of 10,000 man hours, the average cost for the first twenty aircraft would be 8,000 man hours each, the first forty aircraft would average 6,400 man hours each and so on. A levelling off of the curve would be expected after a certain quantity. A certain amount of levelling off is embodied in the formula itself, as a 20% reduction between 500 and 1,000 units is extremely small when investigated on a unit-to-unit basis. Reference to the right hand portion of the 80% curve on Figure 1 illustrates that levelling off tendency. Similarly, in the case of a 90% Learning Curve, each time the quantity of units is doubled the cumulative average cost becomes 90% of the cumulative average cost at the quantity which was doubled. Corresponding relationships exist for other percentages.

While the 80% Curve is a good practical average Learning Curve for Aircraft production, the relative complexity of the design generally results in a slightly different actual performance. As might be expected, the more complex the article, the higher the initial cost and the faster the rate of reduction, since more learning is involved and there is more opportunity for tools to simplify the production as the quantity permits. Conversely, the simpler the article, the lower the initial cost and the slower the rate of reduction. As an example, a fighter aircraft of a given weight may require 35 man hours per pound at the first unit, but reduce along a 76% curve. On the other hand a simple trainer may require only 20 man hours per pound at the first unit, but reduce according to the much flatter 84% curve.

Although the Learning Curves discussed previously are set up to show the cumulative average cost trends, it is possible to plot a curve of unit costs necessary to produce the particular per cent of the progress expected. When plotted on logarithmic graph paper, the approximate formula for the "unit cost curve" plots as a straight line and is parallel to the cumulative average cost curve from the third unit on, at a given distance below it, depending on the per cent reduction of the cumulative average cost. Figure 6 shows the relationship between the cumulative average cost and the unit costs of an 80% Curve and a 90% Curve, resulting in the same cumulative average at the 100th unit. It is noteworthy that from the third unit on, each time the quantity is doubled, the unit cost is a certain percentage of the unit cost at the unit which was doubled. This percentage of unit cost reduction is the same as the cumulative average cost percentage reduction.

(Fig. 6)



NOTE: In this example the total cost for 100 units is the same in either case. Only differences between the two cases are in initial cost and rate of cost reduction.

The following mathematical study of Learning Curves is included in this discussion to provide a better understanding of their behavior and to develop a background for factors and curves which are used in dealing with production costs.

Mathematics of Learning Curves

Before discussing the mathematics of Learning Curves, it is necessary to briefly review some of the principles of the theory of graphic representation.

In any type of graphing, there is a particular relationship between the distance from the origin to a point on the axis and the label (or unit value) assigned to that point. In the case of a linear scale, as on linear graph paper, the distance and the label have a constant relationship which may be expressed.

$$(1) \bar{X} = Kx \text{ Where } \bar{X} \text{ and } \bar{Y} = \text{distance}$$

$$(2) \bar{Y} = Ky \quad k \text{ and } y = \text{labels} \\ \text{and } K \text{ is some constant}$$

Obviously, when the distance is doubled, the value of the label is doubled. In other words, if the value of the first label is \$50.00 and it is a measured distance of 2 inches from the origin, then if the value of the second label is \$100.00, the distance from the origin to the second label will also be doubled and be measured as 4 inches.

On a logarithmic scale, the distance has a constant relationship to the logarithm of the label. This relationship may be expressed:

$$(3) X = K \log_{10} x \quad \text{Where } \bar{X} \text{ and } \bar{Y} = \text{Distance}$$

$$(4) \bar{Y} = K \log_{10} y \quad x \text{ and } y = \text{labels} \\ \text{and } K \text{ is some constant.}$$

Putting (3) and (4) in the exponential form, we have,

$$(5) 10^{\bar{X}} = x^K, \text{ for (3)}$$

$$\text{and (6) } 10^{\bar{Y}} = y^K$$

From (5) and (6) it is apparent that the values of the labels increase in power of 10 as the distances increase in units. Thus, if the distance is one unit, when the label is \$10.00, when the distance is two units, the label is \$100.00 and so on.

It should be remembered that linear graph paper has linear scales on the vertical and horizontal axes, logarithmic graph paper has logarithmic scales on the vertical and horizontal axes, and semi-logarithmic graph paper has a logarithmic scale along one axis and a linear scale along the other axis.

The general equation for a straight line on linear, logarithmic, or semi-logarithmic graph paper is,

$$(7) \bar{Y} = m \bar{X} + B \quad \text{Where } \bar{Y}, \bar{X} \text{ and } B \text{ are distances and } m \text{ is the slope of the line. } B \text{ is the distance from the origin to the intercept of the line with the } y \text{ axis.}$$

A straight line on linear paper must from (1), (2) and (7), be of the form,

$$(8) y = m x + b \quad \text{where } y, x \text{ and } b \text{ are labels}$$

A straight line on logarithmic paper must be, from (7),

$$(9) \log_{10} y = m \log_{10} x + \log_{10} b,$$

Since from (3) and (4)

$$\bar{Y} = K \log_{10} y$$

$$\bar{X} = K \log_{10} x$$

and we let

$$\bar{B} = K \log_{10} b$$

Changing (9) from the logarithmic form to the exponential form, we obtain the general form of the equation for a straight line on Logarithmic paper,

$$(10) y = b x^m$$

When m is positive, (10) is the equation for a parabola and the straight line plotting its function on logarithmic paper has an ascending slope. When m is negative, (10) becomes the equation for a hyperbola and the straight line plotting its function on logarithmic paper has a descending slope. The exponent m is the tangent of the straight line as proved in (7) and (9). As semi-logarithmic paper is logarithmic along y axis, and linear along the x axis, the straight line equation must be of the form.

$$(11) \log_{10} y = mx + \log_{10} b \text{ from (7)}$$

or, changing to the exponential form,

$$(12) y = 10^{mx+b}$$

when the logarithmic scale is along the x axis and the linear scale is along the y axis, the equation becomes

$$(13) x = 10^{my/b}$$

Cumulative Average Cost Curves

As discussed in the theory section of this paper, studies of aircraft production statistics lead to the theory of Learning Curves, which states: "Each time the quantity of planes is doubled, the cumulative average cost will be a certain percentage (generally taken to be 80%) of the cumulative average cost at the quantity which was doubled."

By assuming a value for the percentage reduction and selecting a cost for the first unit, a cost curve representing this theory may be plotted. When this curve is plotted on logarithmic paper, it is a straight line. Since this is true, the equation must be of the form:

$$(14) y = b x^m$$

where y = cost of airplane

x = airplane number

b = cost of the first airplane

m = slope (tangent) of curve on logarithmic paper as discussed in (7), (9) and (10) of this section.

To find the various values for the exponent, take equation (9) and let the y intercept be equal to unity. If the intercept is one, then,

$$(15) x = 1$$

$$(16) y = 1$$

$$(17) b = 1$$

Also, when

$$(18) x = 2$$

$$(19) y = \text{decimal value of percentage} \\ \text{thus } y = .8 \text{ for } 80\%$$

and (17) still holds true.

By substituting (17), (18) and (19) in (9) and solving for m we get,

$$(20) m = 3.32 \log \frac{\%}{100}$$

For which we may calculate the various values of m . Figure 4 lists these values for the most frequently used percentages, and the corresponding slope angles in degrees.

Unit Cost Curves

Mention has previously been made regarding the unit cost trend necessary to obtain a given progress of the cumulative average cost curve. A study of this curve and its equation follows:

Consider a cumulative average curve with an 80% progress. Assume a cost of 100 manhours at the first unit. From (9) we may calculate the cumulative average

cost for succeeding units. Thus, we find the average cost at unit one is 100 manhours, at unit two, 80 manhours; at unit three, 70.2 manhours and so on. Obviously, the cumulative average cost and the unit cost are the same for the first unit. Intuitively, we know that the cost at any unit must be the difference between the total cost at that unit and the total cost of the preceding unit. Thus, the total cost at the first unit is 100 manhours and the total cost at the second unit is 2×80 or 160 manhours. The difference or 60 manhours is the cost of the second unit.

In a similar fashion we may calculate the unit cost at any unit number.

For ease of calculations, the development of the formula for the actual unit cost curve follows.

Let x = the unit number

$(x-1)$ = the preceding unit number

y = the unit cost at x

C_1 = the total cost at x

C_2 = the total cost at $(x-1)$

then from the discussion above we have,

$$(21) y = C_1 - C_2$$

Now, to put (21) into a more workable form,

Let y_1 = the cumulative cost at x

$$= bx^m \text{ (from (14))}$$

y_2 = the cumulative cost at $(x-1)$

$$= b(x-1)^m \text{ (from (14))}$$

Since the total cost at any unit is the product of the cumulative average cost and the cumulative unit number,

$$(22) C_1 = xy_1$$

which also may be expressed,

$$C_1 = x b x^m$$

$$(23) C_1 = b x^{m+1}$$

and,

$$(24) C_2 = (x-1) y_2$$

which similarly becomes

$$(25) C_2 = b(x-1)^{m+1}$$

by substituting (22) and (24) in (21) it becomes

$$(26) y = xy_1 - (x-1) y_2$$

by substituting (23) and (25) in (21) we get another form,

$$y = b x^{m+1} - b(x-1)^{m+1}$$

$$(27) 6y = b(x^{m+1} - (x-1)^{m+1})$$

A study of this formula discloses that it does not represent a straight line but rather a curve with decreasing curvature approaching a straight line as x increases.

The expression in (27) may also be written

$$(28) y = bx^{m+1} \left(1 - \left(1 - \frac{1}{x}\right)^{m+1}\right)$$

Remembering that m is a negative number with a numerical value between 0 and 1 we apply Cauchy's test ratio and find that the series $\left(1 - \frac{1}{x}\right)^{m+1}$ is convergent. By finding

the sum of this series and substituting in (28), we have

$$(29) y = b x^m (m+1) \cdot R$$

Where R becomes very small as x increases. By disregarding R , and substituting from (14) we have the approximate formula for the unit cost curve to attain a predetermined cumulative average cost progress.

$$(30) y = (M-1) b x^m$$

We may change the form of (30) to

$$(31) y = (m-1) y_2$$

From which we may find the unit cost at any unit when the cumulative average cost is known.

An investigation of (30) reveals this approximate formula is correct within 2% from unit three on. To obtain a satisfactory value for the second unit we need only to join the unit cost from (30) at unit three to the cumulative average cost at unit one with a straight line.

By further development of (29) a more accurate formula may be derived which applies from the first unit to any number of units. At the tenth unit this curve is accurate to within .03%. This second approximate formula is expressed as,

$$(32) y = b \left(x - \frac{1}{2}\right)^m (m+1)$$

Cumulative Cost Curves

Cumulative cost curves, as the name implies, are curves representing the cumulated costs at any unit. Since the cumulated cost at any unit is the product of the cumulative average cost and the unit number we,

Let x = the unit number

y = the cumulative average cost at x

y_3 = the cumulative cost at x

then we know.

$$(33) y_3 = xy$$

by substituting from (14), we have

$$y_3 = x b x^m \text{ or}$$

$$(34) y_3 = b x^{m+1}$$

this curve obviously is a straight line, by (10), of ascending slope, and passing through $y = b$.

Fig. 7

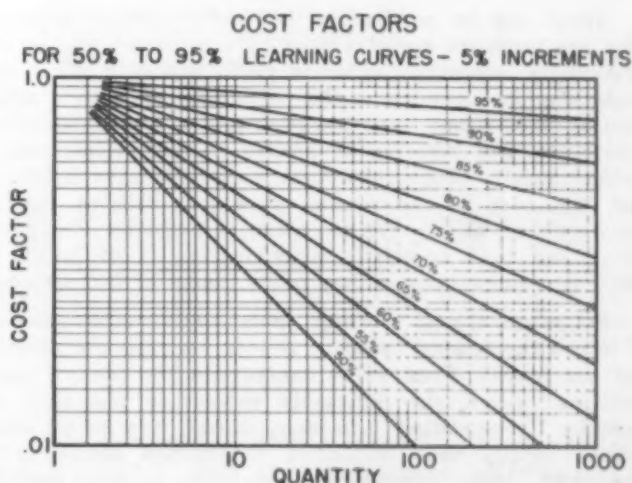


Figure 7 contains Learning Curves based on the table of Figure 4 for quickly obtaining adjustment factors and trends of these curves in 5% increments. Also, listed on Figure 7 are percentages for Learning Curves for raw stock, purchased equipment, tooling and engineering costs as well as aircraft production labor. These curves were established when it was discovered that their plot

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EQUITABLE SELLING PRICE DETERMINATION AND ITS PLACE IN BUSINESS PLANNING

By: Harry P. Kelley

Director of Costs and Budgets, American Viscose Corp., Philadelphia, Pa.

Presenting an extremely thorough review on various methods of selling price determination, this article offers a thrilling challenge to the budget director to expand his activities to this field. The importance of individual product profit, as well as total profit, make this an area no ambitious budget director will avoid.

It is unfortunate that to many the word "budgeting" conveys the meaning that it is a constraining or restrictive function. We who are in the field of budgeting do not think of it as imposing a straight jacket on business. We refer frequently to budgeting as profit planning but actually the field is one which encompasses all forms of corporate planning. Possibly, there should be a new word coined which will describe this important function in the terms of over-all planning and remove the feeling that it is an activity which in some ways restricts freedom.

The ultimate objective in corporate planning is to obtain a desired profit, and the customary starting point is the planning of revenues which generally takes the form of a sales forecast. The sales forecast is the result of considerable study and research, first in the field of general business conditions and then more specifically in regard to detailed market studies relating to the products which are to be merchandised.

Sales income depends upon the two factors of physical quantities and unit selling prices. In most companies, the budgeteer confines his activities to the planning of sales in respect to physical quantities and a calculation of the resulting income therefrom. Determination of proper unit selling prices is a somewhat neglected phase of the work that rightfully deserves more attention than it has heretofore received. This activity is within the frame work of business planning functions referred to in the first paragraph of this article. It should be a part of the job of the budgeteer although it does not fall within the usual connotation of the term "budgeting".

Importance of Selling Price

There can be no dispute that selling prices received for the products manufactured by a company are an exceedingly important factor in profit planning since the relationship between selling prices and profits could not be more direct - any change in prices is communicated instantly and directly to profits. Also, selling prices affect profits since they have a considerable influence on the size of the market. However, despite the importance of selling prices, there is probably less planning and less scientific determination in the realm of selling prices than in any other phase of management.

In most cases, selling prices become a game of "follow the leader" without anyone knowing the identity of the leader. When sales executives are queried about selling prices, the inevitable answer is that they are set by "competition". In many cases, how or by whom these prices were originally determined seems to be unknown. Many companies have items in their product line where the cost has always exceeded the selling price and yet they feel obliged to continue merchandising such items in order to be able to present a complete line.

Probably if an investigation could be made, it would reveal that the particular items referred to are being sold by all companies at a loss. Undoubtedly, such items were originally priced by one company in error and all

other companies followed the pattern set by "competition". Of equal importance are selling prices which yield too great a profit since such prices tend to shrink markets. An examination of a product line sometimes reveals selling prices that yield a wide profit range running from losses to extremely high profits. Selling prices that yield profits that are either too large or too small result in serious economic losses.

Reason For Price Variations

One of the reasons for inequitable product selling prices is the fact that collusion in the setting of prices is a violation of the anti-trust laws and therefore, there is a great reluctance among companies to even discuss this subject. Naturally, in a democratic form of government and in the common interest of all citizens, we all agree that collusion should be illegal but this does not prohibit announcement and discussion of sound principles for determining selling prices.

In order to eliminate ruinous product pricing, certain industry trade associations have developed uniform cost accounting methods so that all companies within an industry will determine costs by generally accepted methods. At least, each company in the industry has a knowledge of its product costs and this should serve as a deterrent in establishing prices at less than costs.

In addition to determination of proper product costs, the economics of establishing equitable selling prices should be known by all manufacturing companies. It is believed that wider use of these principles will eventually tend towards the elimination of inequitable selling prices and their resulting economic losses.

There are several theories regarding how selling prices of manufactured products should be determined. These theories differ principally in the computation of the profit to be added to total costs to arrive at the selling price. This problem has two parts; in the first place, the total amount of normal profit that a company should make and secondly, the method of applying this profit to individual products to arrive at equitable selling prices.

Planned Profit Determination

Before describing various methods that are used to determine selling prices of manufactured products, the subject of total planned profit determination will be considered. There are many factors that enter into the determination of how much profit a corporation should earn. Many companies believe that the total profit after taxes should be about 12% to 15% of net worth. Its determination will differ between companies because of difference in fiscal policies, financial structure and the degree of risk.

The degree of risk is related to the type of product manufactured, research activity in the particular field and the probability of product obsolescence. In any event, the profit should be sufficient to permit the payment of a dividend to the stockholders that represents a

proper return on investment and retain enough of the profits to guarantee proper growth of the company. If, for example, it is believed that fifty percent of the earnings should be paid out in dividends and the balance retained for future growth, then the computation of planned profit for a normal operating level may be determined without too much difficulty.

The subject of what constitutes an equitable amount of profit and how it may be computed has many factors that are beyond the scope of this article. We are concerned in this discussion only with the problem of applying profit to costs to determine equitable selling prices.

Selling Price Determination

Three methods that are used in the determination of selling prices will now be reviewed. It is assumed that standard manufacturing costs have been developed on the basis of normal operating capacity and that in each case a profit factor will be added to the normal cost including commercial expense to arrive at the selling price. The three methods that will be discussed in this article are the following:

1. Profit computed as a percentage of total cost
2. Profit computed as a percentage of the cost of fabrication
3. Profit computed as a percentage of the investment required to manufacture each item

The method outlined in (1) above is most commonly used in industry. In order to illustrate how this method is used, it will be assumed that in a particular manufacturing business, the planned normal profit has been determined and at normal operating capacity the following conditions exist:

(a) Total planned normal profit (before taxes)	\$200,000
(b) Total normal commercial expense (selling, administrative and research costs)	100,000
(c) Total normal manufacturing cost:	
Raw materials cost	\$ 75,000
Direct labor cost	300,000
Normal burden cost	325,000
	700,000
(d) Total Sales	\$1,000,000

From the above figures, it is a simple matter to compute the percentage of profit to total cost, \$200,000 over \$700,000 + 100,000 or 25%. Also, the computation for normal commercial expense is \$100,000 over \$700,000 or 14.3% of manufacturing cost.

The selling price of a product computed in accordance with method (1) would then be determined as shown in the following example:

(a) Raw material cost	\$ 1.40
(b) Direct labor cost	6.10
(c) Normal burden cost	6.50
(d) Total Manufacturing cost	\$14.00
(e) Commercial Expense (selling, administrative and research cost) - applied as a percentage of manufacturing cost (14.3% of d)	2.00

(f) Total Selling Cost	\$16.00
(g) Profit - applied as a percentage of total selling cost (25% of f)	4.00
(h) Selling Price	\$20.00

This method assumes that the profit to be derived from each product should be the same percentage of total cost. No distinction is made between products where the raw material cost is a large percentage of the total cost as contrasted with products where the raw material cost is a small percentage of the total cost. Also, no distinction is made between products that require a large investment in manufacturing equipment as contrasted with products where the investment is relatively small. The fact that the "percentage of total cost" method does not recognize these differences in determining selling prices makes this method undesirable. As developed later in this article, selling prices determined by this method will be shown to be inequitable.

Profit Percentage Method

The method outlined in (2) above is described as one where the profit is computed as a percentage of the cost of fabrication. This method is based upon the premise that the profit from a manufacturing business should be determined from the labor and facilities used in transforming a basic raw material into a different form. This method assumes that it is not the purpose of the manufacturing business to make a profit on the basic raw material and that all of the profit should be derived from the use of manufacturing facilities, labor, organization, technical know-how, etc.

For the purpose of explaining method (2), the same statistics for the business will be used as with method (1), namely:

(a) Total planned normal profit (before taxes)	\$200,000
(b) Total normal commercial expense	100,000
(c) Total normal manufacturing cost:	
Raw materials cost	\$ 75,000
Direct labor cost	300,000
Normal burden cost	325,000
	700,000
(d) Total Sales	\$1,000,000

From the above figures, the percentage of profit to the total fabricating cost is \$200,000 divided by (\$300,000 plus \$325,000 plus \$100,000) or 27.6%. Also, the percentage of commercial expense to the direct labor and burden cost is \$100,000 divided by (\$300,000 plus \$325,000) or 16%.

It will be noted that this method (2), Commercial Expense is computed as a percentage of labor and burden cost rather than as a percentage of total manufacturing cost. This differs from method (1) since it is assumed that the activities of the Sales, Administrative and Research Departments are related to directing and selling the use of the manufacturing facilities in changing the form of the raw material.

The effect on the selling price of computing the profit

factor in accordance with methods (1) and (2) is exemplified as shown below:

	Product A		Product B	
	Profit as a Percentage of Total Cost	Profit as a Percentage of Fabricating Cost - Method (2)	Profit as a Percentage of Total Cost	Profit as a Percentage of Fabricating Cost - Method (2)
	Method (1)	Method (2)	Method (1)	Method (2)
	\$	\$	\$	\$
(a) Raw material cost	1.40	1.40	9.80	9.80
(b) Direct labor cost	6.10	6.10	2.00	2.00
(c) Normal burden cost	6.50	6.50	2.20	2.20
(d) Total manufacturing cost	\$14.00	\$14.00	\$14.00	\$14.00
(e) Commercial expense	2.00 (14.3% of d)	2.02 (16% of b + c)	2.00 (14.3% of d)	.67 (16% of b + c)
(f) Selling Cost	\$16.00	\$16.02	\$16.00	\$14.67
(g) Profit	4.00 (25% of f)	4.04 (27.6% of b + c + e)	4.00 (25% of f)	1.34 (27.6% of b + c + e)
(h) Selling Price	\$20.00	\$20.06	\$20.00	\$16.01

It will be noted that Product A and Product B have the same manufacturing cost of \$14.00 but with Product A the raw material cost is 10% of the manufacturing cost whereas with Product B the raw material cost is 70% of the manufacturing cost. By using method (1), a selling price is computed for each product that is identical, \$20.00. By using method (2), the computed selling price of Product A is \$20.06 and the computed selling price of Product B is \$16.01. These examples illustrate the difference in results between the two methods.

Profit on Raw Materials

The method of computing profit as a percentage of fabricating cost in the determination of selling prices eliminates one of the objections to the computation of profit on the basis of total cost, namely the effect on profits of the cost of raw materials. As stated before, it is obvious that a manufacturing business should not aim to make profits from raw material transactions since to do so is tantamount to being in the jobbing business and speculating in raw material markets. It is also evident, as illustrated in the foregoing example, that a manufacturing company should derive a larger profit from a product with a 10% raw material cost and a 90% labor and burden cost than from a product with a 70% raw material cost and a 30% labor and burden cost. In the former case, the manufacturing company has made a far greater contribution to changing the form of the raw material than in the latter case.

The method of determining selling prices by computing profit on the cost of fabrication does not solve the problem of giving proper effect to the differences in investment required to manufacture various products. Since the only purpose of the investment in any company is to derive a profit therefrom, it follows that the selling price of each product manufactured should include a profit based upon the investment required to manufacture that product. This is previously referred to in this article as method (3). If selling prices are to be relatively equitable, then the profit factor in the selling price of each product will yield the same return per dollar of investment required to manufacture the product.

Explanation of Methods

The mechanics for determining selling prices in accordance with the principles advocated in method (3) will now be explained, viz:

- (1) As previously explained, the first step should be a determination of the desired annual normal net profit. The amount should be sufficient to support a market price for the stock that will yield an adequate return to the stockholder and to provide sufficient retained earnings for the future growth of the company.
- (2) Determine the annual normal profit before income taxes.
- (3) Determine the investment at cost in manufacturing facilities, such as land, buildings, machinery and equipment. If replacement values of plant investment are available or can be computed by the use of construction indices, they should preferably be used since the accuracy of the computations will be enhanced if all values are related to the current purchasing value of the dollar.
- (4) Determine the normal investment in inventories, accounts receivable and cash.
- (5) Divide the annual normal profit before taxes by the investment described in (3) plus (4).
- (6) From property records and generally accepted cost accounting methods, determine the investment described in (3) above by department or burden center. Also, allocate the investment in inventories, accounts receivable and cash to burden centers on the respective basis that is considered to be most equitable.
- (7) After the total investment has been determined by burden center, it will be necessary to distribute the investment in service burden centers, such as power house, payroll department, engineering department, etc. to the productive burden centers. This should be done in exactly the same manner

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TRAVEL EXPENSE -- A BUDGETED ITEM

By: John B. Morgan

Administrative Accountant, Temco Aircraft Corp., Dallas, Texas

Presenting the results of a survey by the Dallas Chapter, N.S.B.B., on several controversial expense items....Travel Expense, Entertainment Expense, Expense Reimbursement, and Miscellaneous Policies. An interesting and revealing review disclosing the varied methods employed by ninety organizations.

We sometimes think of travel expenses much in the vein that Mark Twain once referred to the weather. It's something that everyone talks about but no one can do much about. We at Temco have talked much about travel expenses and how to control them. We have issued printed travel instructions and management bulletins on suggested limits, and we have travel budgets. In fact, in developing budgets we have had the spending departments attempt to estimate their travel requirements and have budgeted accordingly. We have had the budget department attempt to set realistic standards approved by the budget committee and at present we are operating under rather arbitrary budget standards set on a "best last year" basis.

In our business, predominantly sub-contracting work, we have many customers requiring frequent contacts on production problems and our travel requirements are not readily predictable. We have used quarterly budgets and annual budgets and have always reported budget and actual figures to the spending departments in various transportation, entertainment and other categories. I believe we have had some success in making personnel travel expense conscious and have curtailed some expense items, but I am sure that we, like most of you who may read this article, feel that despite budgets and proper internal controls, this item of expense does not readily adapt itself to cost reduction and budget control as much as most members of management would like it to.

Travel Expense Survey

With that bit of background, we at Temco were delighted to cooperate with the Dallas Chapter of the National Society for Business Budgeting in conducting a limited survey of major companies in many fields of business in an attempt to get some ideas of how this problem is met throughout industry and to see if any trends could be determined. In conducting the survey we prepared a rather simple but general 18 question multiple choice questionnaire which we felt covered the more important areas of travel and entertainment policies. These questionnaires were mailed to some 180 companies which included large and small firms in various industries.

We surveyed the national membership of the National Society for Business Budgeting, most of the major aircraft companies and a cross section of local industries in the Dallas area. We received a slightly better than 50% reply, and companies replying included most of the larger aircraft companies, several large automotive firms, light and heavy manufacturing, food and beverage firms, clothing manufacturers, chemical and pharmaceutical firms, publishing companies, public utilities, airlines, oil companies, insurance companies and others.

While some 90 replies may not be a large number on which to base our survey, we feel that the results were most encouraging and the wide variety of companies, large and small, participating certainly add some credence to the finding. The interest in this subject expressed by many of the replies and some of the friendly remarks concerning their enjoyment at finding someone besides

themselves who found travel expenses and travel budgeting a troublesome problem made the venture most worthwhile.

Of the 92 firms replying, 21 or 23% were engaged predominantly in government business, while 71 or 77% were engaged predominantly in commercial business.

The findings are presented in four basic categories:

Part I -- Concerning Travel Budgets

Do you operate under a formal travel budget?

Business Predominantly	Yes		No		Total	
	No.	%	No.	%	No.	%
Government	18	86%	3	14%	21	100%
Commercial	52	73%	19	27%	71	100%
All firms replying	70	76%	22	24%	92	100%

Firms were asked to indicate who set the budget allowance.

	No.	%
Budget Committee	9	10%
Budget Department	4	4%
Spending Departments and reviewed by Budget Group	64	70%
Not applicable	15	*16%

*It is noted that while 22 firms said they had no formal travel budget, 7 indicated that spending department's expenses were reviewed and commented on by higher management.

Part II -- Concerning Entertainment Expense

In this category 28 firms or 30% reported that entertainment was a separate budget, while 64 or 70% indicated it was treated as any other travel item.

We were concerned with who was permitted to entertain at company expense and what was the last approval required on such expenses. We used five levels of management roughly segregated as follows:

- 1st line management - Top executives - company officers
- 2nd line management - Senior executives - Division heads managers - Executive assistants.
- 3rd line management - Intermediate executives - Superintendents, Department Heads, etc.
- 4th line management - Junior executives - Assistant Dept. heads, General foreman, staffs asst.
- 5th line management - Supervisors - foremen etc.

	Lowest Group Allowed to entertain		Last Approval Required	
	No.	%	No.	%
1st line management	9	10%	33	36%
2nd line management	13	14%	32	35%
3rd line management	37	40%	10	11%

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BUDGETING AND ACCOUNTING IN THE U.S. GOVERNMENT

By: W. J. Edmonds

Assistant Comptroller, Standard Oil Company of New Jersey

So you think you've got budgeting problems! Sit back and read about the biggest budgeting job on earth . . . and how the U.S. Government is taking steps to improve it's budgeting techniques.

Early each year there appears in the news a summary of the Budget which the President of the United States recommends to Congress for the next fiscal year. The Budget document presents a resume of progress in the affairs of the nation and a condensed statement of the "Budget Expenditures" in various categories which are proposed to establish adequate defense and carry out other policies. The impact of these expenditures on the economy and their relation to national welfare is discussed in the Economic Report of the President. These reports - the Budget document and the Economic Report - are worthy of your study.

The President's Budget proposals are the result of nearly 18 months of planning, analysis and discussion of recommendations which department heads and agencies had submitted several months previously to the Bureau of the Budget. The Bureau, which has the direct responsibility for the preparation of the President's budget, coordinates all these activities. The document which actually goes "up the hill" to Congress contains about 5 pounds of tables of figures and documentation.

Congress in its appropriation committees, holds hearings and makes its own investigations. By July 1 Congress has enacted most of the enabling bills and appropriations. The latter authorize the President to "commit" through the medium of the departments and agencies.

Accounting and Control Problems

These appropriations or authority to commit are then apportioned by the Bureau of the Budget and allotments are made within the agencies. At this stage the problem of adequate accounting and control becomes serious indeed. For example, one army base received over 10,000 separate allotments. These were its "budget." The accounting job to keep track of them was tremendous and frustrating, the control of cost at the point of operation practically non-existent, and the possibility of financial reporting, as we know it, quite remote. Not even have inventories on hand been known to those responsible for making "Budget" recommendations to Congress.

A basic reason for such situations is that the responsibility for formulation of adequate accounting and budget procedures has not been clearly centered in any one executive agency. Actually, the General Accounting Office - an arm of Congress - has done more than any agency of the Executive Department to promote better procedures and has been the leader in the Joint Program of the General Accounting Office, the Bureau of the Budget, and the Treasury Department. This joint program was set up by the Budget and Accounting Procedures Act of 1950.

This briefly was the state of affairs found by the second Hoover Commission, or Commission on Organization of the Executive Branch of the Government, which was established by Congress in 1953. Between February and July 1955, the Commission submitted to Congress 19 reports which contained some 426 separate recommendations affecting in varying degree the functions and responsibilities of all departments of the government. Each of these 19 reports was based on a report of a Task Force which has worked for 18 months. Departments of the Government are now evaluating these recommendations to see which can be put into effect by administrative action and

which must await Congressional action. Congress is reviewing legislative proposals to implement some of the recommendations.

Importance of the Budget Report

Recommendations that affect all branches of the Government are made in the Budget and Accounting Report. Some of these are repeated in slightly different form in the report on Business Organization, Department of Defense. Mr. Hoover himself places a great deal of emphasis on the Budget and Accounting Report. For example, at a U.S. Chamber of Commerce meeting of business leaders he said:

"In the preparation of the budget lies not only the control of departmental expenditures but also power to insist on efficient methods of conduct in the spending agencies. And within a more effective budgeting system lies the restoration of the fuller control of the national purse to the Congress, which has in great degree been lost."

He coupled this report with an equally important one on Personnel and Civil Service which would up-grade government jobs and salaries to attract and hold qualified men. Mr. Hoover said of these two reports: "They reach much further than saving money and taxes. Competence and leadership in the housekeeping of our government are a contribution to freedom in every American home."

A bill has been introduced in the Senate by 22 senators to improve government budgeting and accounting methods and procedures by amending the Budget and Accounting Act of 1921. This bill, S.3199, will probably be still in debate when this article reaches you. I hope you will take it upon yourself to write to your senators and congressmen on its behalf. It includes nearly all of the recommendations of the Budgeting and Accounting Task Force. Taken together these cover all of the requirements of a sound financial management for the U.S. Government.

The Accounting Foundation

First, a foundation of good accounting must be laid by carrying out the following recommendations of the Budgeting and Accounting Report (covered by Sec. 2 (b) (S-3199).

"That the Government accounts be kept on the accrual basis to show currently, completely, and clearly, all resources and liabilities, and the costs of operations. Furthermore, agency budgeting and financial reporting should be developed from such accrual accounting." (These and subsequent quoted recommendations are from the Budget and Accounting Report of the Commission on Reorganization.)

"That the executive agencies accelerate the installation of adequate monetary property accounting records as an integral part of the accounting systems."

Budget Procedure

This foundation of good accounting would make it possible to have budgets based on the cost of doing the job and to hold the organization units responsible for performance. Recommendations on cost budgeting (encompassed in Section 1 (b) of S.3199) are:

"That executive agency budgets be formulated and administered on a cost basis."

"That for management purposes, cost-based operating budgets be used to determine fund allocations within the agencies, such budgets to be supplemented by periodic reports on performance."

The 1956 budget contained over 1200 pages of detached information and also a series of summary tables. A document so complex should be simplified. At the same time, Congress should be informed of the proposed programs as to be in position to give adequate consideration to the size of the programs and the performance and efficiencies of the agencies. For example, the total cost of farming aid, foreign aid, or government research should be known wherever it is to be administered. Moreover, as appropriations are requested it should be possible to give Congress an accounting of past performance and proposed cost by organizational units. In order to accomplish this, two recommendations were made:

"That the executive budget continue to be based upon functions, activities, and projects adequately supported by information on program costs and accomplishments, and by a review of performance by organizational units where these do not coincide with performance budget classifications."

"That the agencies take further steps to synchronize their organization structure, budget classifications, and accounting systems."

Annual Reporting - An Aid to Better Budgeting and Administration

The President is responsible for promoting efficiency in the executive agencies. Annual reporting and executive review of performance in relation to program cost should be required, and it was recommended:

"That the executive agencies report annually to the Bureau of the Budget on the conduct of their operations. On the basis of the agency reports and other available information, the Bureau should prepare for the President an annual report on performance for the executive branch as a whole."

After the recommended accounting procedures are established, reports of the agencies can be used as the basis of a consolidated system of financial reporting for the government as a whole, which will be more comprehensive than the Treasury fiscal reports. To quote the Task Force, "The Congress should consider amending the Budget and Accounting Procedures Act of 1950 to make the Bureau of the Budget responsible for developing comprehensive reports (other than purely fiscal reports) showing the financial results of the activities of the Government as a whole and of its major component activities."

Organization

While many agencies have begun and a few have completed the overhaul of accounting systems along these lines, many are handicapped by lack of suitable men. The Budget and Accounting Task Force and Commission recognized that the organization for accounting and budgeting had to be strengthened, both in the agencies and the Bureau of the Budget, and it recommended: "That there be established under the Director of the Bureau of the Budget a new Staff Office of Accounting headed by an Assistant Director for Accounting."

"That as an aid to financial management the position of Comptroller be established in the principal agencies and major subdivisions thereof."

Actually, almost every agency has now a position that in some respects corresponds to that of a Comptroller, but there is wide variation among the agencies in the

powers and duties of these positions. In the interest of improving fiscal performance it is believed that much could be achieved through the clear delineation of the major functions of an agency comptroller.

The duties of these agency comptrollers, as set out in the Budget and Accounting Report, would be:

1. To maintain adequate accounting and auditing procedures.
2. To recruit, train and develop qualified personnel.
3. To develop reliable and informative financial reports.
4. To direct the preparation, and review execution of budgets prepared at the operating level.

It is expected that the Bureau of the Budget would assist the agencies in the selection and training of personnel. Specifically the Commission recommended: "That the selection of agency comptrollers and the build-up of competent accounting organizations in the executive agencies through the selection, training, and retention of capable personnel be an important phase of the guidance and help to be given by the Assistant Director for Accounting in the Bureau of the Budget."

The training of personnel for the Bureau of the Budget itself could be tied into this program, by placing Bureau representatives in the agencies. This would facilitate the work of the Bureau, and promote the preparation and administration of the budgets and other work of importance to the Bureau in the agencies. Such personnel should be of a high level and should be rotated from time to time.

The Task Force felt that the Bureau of the Budget, as the right arm of the President, should strengthen its staff to more fully discharge its responsibilities for:

1. Preparation and administration of the President's Budget.
2. Evaluation and development of improved plans for the organization, coordination and management of the executive branch of the Government.
3. Reviewing and analyzing for the President proposed legislation.
4. Coordinating and improving Federal statistics.

The following recommendations were made:

"(a) That the Bureau of the Budget expand and make more effective the discharge of its managerial and budgeting functions;

"(b) That in order to do this, among other things, it should place in important agencies one or more well qualified employees whose duties should include continuous year-round review, at the site of the agency, of agency budget preparation and administration and other facets of the Bureau's managerial responsibilities; and

"(c) If necessary, the Congress should increase the resources of the Bureau of the Budget for that purpose."

It is believed that these measures would be a major factor in achieving sound budget and accounting methods and would aid in developing some degree of uniformity in this field.

Coordination

In order to tie in budgeting and accounting with the auditing function of the Comptroller General and to avoid duplication of effort, joint studies are to continue by GAO and the Bureau of the Budget (Sec. 5-S.3199). They are specifically directed to determine what steps can be

taken to eliminate duplicate accounting between the Treasury and other departments. This is an important provision, since the Treasury Department has kept records and made reports of the status of expenditures against all appropriations and allocations of appropriations. Under the procedures now recommended the Bureau of the Budget would take over the major responsibility for accounting progress in the whole Executive Department of the Government.

Action By Congress

The bill before Congress comprehends in one form or another all of these recommendations. If it is passed, it will give budgeting and accounting reform a tremendous impetus. Yet, the full adoption of the program recommended will, even under the best conditions, take years. Progress will depend largely on administrative action and in organization for accounting and budgeting in the various departments and agencies. As advances are made in budget preparation and control, Congress may be willing to simplify the appropriation structure.

Today, Congress authorizes agencies to commit and give them in many cases more than one year to commit. This means that expenditures may take place from one to several years afterwards — or sometimes never. For example, of \$68 billion of unexpended authority as of July 1, 1954, \$22.8 billion was not then obligated.

The Task Force on Budget and accounting recommended that the obligation-type budgeting be discontinued, and recommended:

"That the executive budget and congressional appropriations be in terms of estimated annual accrued expenditures, namely, charges for the cost of goods and services estimated to be received."

In the case of longlead-time programs such as for weapons procurement and major construction, Congress would also provide contracting authority beyond the budget year, but would retain full control by the process of approving only the funds to be spent each year. Congress would review the program annually from the standpoint of costs and accomplishment, both completed and projected.

The sponsor of S.3199, Senator F. G. Payne of Maine, explained that while he approved of this objective the agencies would have to get their accounting and budgeting in order before this would be practical. In his testimony before the Senate Committee on Government Operations he said: "I believe this to be a very essential step and one that should be taken, but it appears to me that the success of the proposal will depend on a basic foundation of adequate accounting and an ability to program effectively. In other words, it would require a solid foundation. The bill is intended to develop such a foundation and, if it is enacted, it is my intention to draft a bill to carry out the accrued expenditure proposal after the accounting provisions of S.3199 have had time to become effective."

Comptroller General Joseph Campbell at the annual dinner of the American Institute of Accountants endorsed this measure and in effect asked Congress to pass it since it would require that accounting improvements be speeded. He said, "Although we are well along the way in the evolutionary development of improved accounting in the Federal Government, accounting would reach its full measure of effectiveness much sooner were current management and congressional practices changed to provide greater impetus to accounting improvements. To our way of thinking, the cost budget proposals and the related accrued expenditure approach to the granting of appropriations recommended in the Budget and Accounting Report of the Hoover Commission represent a practical

contribution to the solution of this problem and do merit your support."

These proposals deserve the support also of the members of the National Society of Business Budgeting. I hope you will write to your Congressmen and Senators urging the passage of Senate Bill S.3199.

Those of you who visit Washington might inquire as to the progress made, as a stimulant to further progress. Our civil servants and administrative personnel will welcome your support of better government through better budgeting.

EDITOR'S NOTE — Latest information is that a revised bill, such as discussed in the article on budgeting in the U.S. Government, this issue, will be presented by Sen. John F. Kennedy (D., Mass.), an outgrowth of one by Sen. Frederick G. Payne (R., Maine). The editor points out, also, that the publication of this article in no way indicates that the National Society for Business Budgeting necessarily supports any of the legislation described, and all opinions and comments are those of the author.

-- Ed.

N.S.B.B. MEMBERS SOUGHT AS SPEAKERS

Members of the New York Chapter, N.S.B.B., are often sought after as speakers for meetings of other organizations. No fewer than six of them served in such capacity in recent weeks:

RAY SERENBETZ, led an American Management Association seminar.

JAMES SHACKELFORD spoke at George Washington University, Washington, D.C.

WALTER STONE spoke at a meeting of the Drop Forging Association.

LOUISA A. McCARTON led an American Management Association seminar.

JACK SELKOWITZ was a speaker at Rutgers University. C. H. ECKELKAMP spoke at an American Management Association seminar; at Pace College Accounting Club; at George Washington University, Washington, D.C., and at N.A.C.A. meeting in St. Louis, Mo.

There may have been others who served speaking roles too modest to report that fact, so we apologize if there are any omissions.

JOINS EDITORIAL STAFF

Mr. L. P. (Larry) Haverkamp, budget executive with Trailmobile, Inc., Cincinnati, has accepted the appointment of president W. D. McGuire to the editorial staff of Business Budgeting; he will serve as Associate Editor, and will handle the "Newsletter" portion. Attention all Chapter presidents: henceforth, please address all Chapter Newsletters and other news material direct to Mr. Haverkamp. Glenn A. Blair, as editor, will handle the technical article portion of the magazine.

A LETTER FROM PARIS

"Business Budgeting" exchanges magazines with several other publications, but this month received a most interesting exchange magazine from Paris, France. It is written entirely in French, and was accompanied by a letter likewise in French, which we haven't had translated yet. It is from "Ordre National Des Experts Comptables Et Des Comptables Agrees". Our highschool French is inadequate to comprehend -- anyone like to take a look?

THE INFLUENCE OF AUTOMATION ON BUDGETING

By: Alwyn M. Hartogensis

Chief Methods Consultant, Ebasco Services Inc., New York, N.Y.

Planning for an industry or for an organization is closely related to its individual economic characteristics. When a technological trend such as Automation affects the economic characteristics, it also affects the techniques and objectives of budgeting and forecasting. This article looks at the probable future influence of automation on profit-planning.

The use of automation is not new. The mechanical governor on the steam engine and the thermostat on a source of heat are old and familiar examples. But when specialized efforts were undertaken to extend the art to more and more processes, it became convenient to coin the descriptive word "automation."

Automation is a relative and somewhat informal term which has not yet been precisely and authoritatively defined. I have recently seen an array of twenty different definitions of the term by twenty experts in the field. It seems to me that the term is applied to both of two basic objectives:

1. The mechanical movement and positioning of materials between a series of operations, such as the transfer machine.
2. The automatic and self-correcting regulation of a process, such as the various feed-back systems.

These two different basic objectives have one general objective in common. By building a single decision or a group of alternative decisions into the mechanism, the mechanism selects or computes the applicable decision and applies it without constant human attention, or with less constant human attention.

Partial automation is already in use and making progress at an accelerated rate. Complete automation, or the push-button factory, at least in most industries, is not imminent. It presently is barred by economic considerations as by technical considerations. The budget man is well qualified to interpret these economic factors in terms of financial requirements, future sales volume and prices, costs, and profits.

Cost Justification of Automation

By definition, automation increases required investment in equipment and consequently increases fixed costs. In order to be economically justifiable, automation must reduce variable costs, such as the cost of labor and the value of scrap, at a sustainable volume of production, by an amount in excess of the increased fixed costs. In substituting fixed costs in place of variable costs, automation increases the break-even point.

It also may be apparent that as labor costs change from directly variable to relatively fixed costs by reason of such contract requirements as a guaranteed annual wage, automation becomes more feasible economically.

Automation Shifts Emphasis From Short-Range To Long-Range Planning

The essential difference between a variable cost and a fixed cost lies in the period of time for which the cost is committed. Material costs, on the accounting basis, vary with the usage of materials, and on a cash basis with the purchase commitment and inventory turnover period. Labor costs, depending on terms of employment, may involve a fixed commitment for an hour, a day, or a longer period. True fixed costs, on the other hand, are fixed for the life of the property in connection with which they arise or with the maintenance of a particular level of capacity.

On a production unit basis, variable costs are more or less constant, while fixed costs tend to vary inversely with volume. Therefore, in any study of the economics of automation, a comparison of the fixed costs added with the variable costs displaced, must be based on an assumed minimum future volume of salable production. Short-range planning which is effective for controlling material and labor costs must be supplemented by long-range planning in order to control the fixed costs of depreciation, property insurance, and property taxes as well as to provide for and pay off on financial needs.

The higher break-even volume required by automation carries an additional element of risk. Do we rationally increase our risk gratuitously, or do we expect to be compensated for that risk by greater return? In other words, we must evaluate the risk involved in order to make a sound decision on the economics of automation.

The Long-Range Sales Forecast Is Prerequisite To Intelligent Entry Into Automation

Since automation must be supported by adequate volume over the life of the automated equipment, a sound long-range sales forecast is indispensable. We sometimes hear of machines which will increase production one hundred fold over previous methods, but if we cannot sell that volume, it might be suicidal to provide such capacity.

In order to obtain and retain the required volume for automation, it may well be necessary on the one hand to spend more for sales promotion and selling, and on the other hand, to reduce price. In order to maintain total employment markets must be expanded. Cost savings must go into price reduction rather than increased wages and increased selling and promotion expenses. For these reasons, profit margins are likely to be reduced. There will be times when the product must be sold on the basis of marginal cost in order to absorb some fixed overhead. These conditions should be anticipated before a substantial investment is committed to automation.

If it is expected that volume will fluctuate substantially, and if the factor of obsolescence in the new machine is not considered serious, it might become desirable to treat depreciation as a variable cost by calculating it on the basis of volume or output, rather than on the basis of time. This is risky because it is dependent on long-range forecasts of output and because, as indicated, it neglects the consideration of obsolescence.

Manufacturing Budgets Also Are Affected By Automation

The introduction of automated equipment and processes reduces manufacturing flexibility. In the first place, we have seen the necessity for sustained volume. In the second place, the cost of setup and other adaptations to changes in product or product design are costly. To some extent, automated equipment is special purpose equipment.

With substantial automation, labor costs become associated with equipment operating time, rather than with output, and indirect labor tends to replace direct labor. Maintenance labor increases, and in order to insure continuing high production output, a planned preventive maintenance program may be imperative.

(Please turn page)

In some industries, automated plants or equipment will operate on an around-the-clock basis in order to minimize fixed costs per unit of output, that is to minimize the amount of equipment required to provide the necessary capacity. However, where the automated process is operated normally on a one-shift basis, there occasionally will be need for a second, or possibly a third shift. Extra shifts on other than a permanent basis may involve problems in obtaining the required supervisory and technical skills for temporary periods. At the least, substantial training expenses and increased maintenance requirements will be involved.

Although operating supplies and a few other expenses theoretically will remain as variable expenses, economic considerations often will make it desirable to reduce fluctuations in volume of output, so that these expenses will be virtually constant from month to month.

Since I do not look for many conversions to completely automated plants in the near future, the extreme conditions described will not fully materialize. These are trends which will appear — in fact they are appearing already — and will gradually increase in their influence. How soon and how far, we do not know.

Cash Budgets Must Be Calculated With A Sharper Pencil And A Longer-Range View

Increased depreciation expenses of an automated or partially automated plant will generate more cash, but more cash will be required for the original investment and for subsequent replacements. Experience indicates that depreciation does not provide for replacement, not only because of inflation, but also because continually improved equipment is more expensive than the equipment replaced. As improvements and advances continue, the factor of obsolescence may be high even on the most advanced equipment now available. A new, well-financed entrant into an industry, which may be a strongly entrenched firm in another industry, could have an overwhelming cost advantage over established companies. In addition, continuing inflation, which further increases future replacement costs, can present serious financial problems. And the entire economic structure of the company depends on sustained volume.

Since the idle funds accumulating from depreciation and retained earnings do not earn a satisfactory return, a tendency may be expected to finance to a greater extent with debt, payable perhaps on a serial basis.

The pressures generated by competitive position may well lessen the useful economic life of new equipment. One substantial improvement after another might obsolete new equipment before it is very old. For this reason, calculation of the economy of automation must take a longer and deeper look into the future than the customary engineering economy study. It must consider possibilities of obsolescence of several future generations of replacing equipment.

It Is Wise To Look At Automation In Perspective

The trend to automation will not materialize overnight. It will be a gradual development in most industries. Certain processes and operations, rather than entire plants, will be automated, at least for the near future. The trend may later become more revolutionary.

The reasons for a gradual rather than a sudden growth of automation is inelasticity of some current products, inflexibility for changes, and that with continual improvements in sight, the obsolescence factor of new

THE GROWING IMPORTANCE OF LONG RANGE PLANNING

By: W. F. Maxwell

Manager, Valuation & Budget Division
The Atlantic Refining Company, Dallas, Texas

If you're letting the fear of inaccuracy scare you out of long-range forecasting, don't! A long-range plan need not be accurate to be useful!

The idea of trying to size up future prospects for a protracted period and to develop realistic results may seem fanciful to many — and it would be if pin-pointed precision were required of all forecast factors. But in this fast moving business world it has become essential to take a good long look ahead in order to see in what general direction we are headed and to correlate current decisions thereto.

Of course as prospective events are projected in time, the picture becomes more cloudy, but in some industries it is necessary to "guesstimate" into the fuzzy future. In the oil producing industry, plans are now in operation to find the oil that will be needed by the consumer 10 to 20 years from today. An average of at least five — and in many cases ten — years is involved before a gleam in the eye of a geologist may be transformed into the drilling of an exploratory test.

Need for Long Range Planning

The fact that nine out of ten of such wildcat tests will probably be dry after many years of planning is only one of the reasons that oil producers must take the long chances of looking well ahead and must develop a program to help in guiding current activities. Similarly, other members of industry need long range plans — rationalized

equipment, plus the cost of conversion, tends to offset the short-term savings.

If a plant is only ten percent automated, only ten percent of the effect on the cost structure will be felt. This creeping effect on the break-even point is to be watched. In a fully automated plant, the need for very long-range planning would be obvious. Where only a small portion of the plant is automated, the need may be overlooked.

Each addition of automated equipment and processes is likely to increase the volume required to break-even. Failure to maintain that volume might make a particular process unprofitable, but this fact may be concealed in the overall results.

For this reason it is desirable not only to project the effect of automating individual processes and operations, but also to analyze the subsequent results in comparison with the projection. Since the available work, when volume declines below capacity, will probably be channeled to the automated equipment and idle time will be concentrated on the old equipment as far as possible. Analysis becomes a question of incremental costs.

As automation and its use in industry progresses, the use of forecasting and budgets may be expected to increase in complexity and importance. Emphasis may be shifted in several respects as fixed costs increase at the expense of variable costs. Most certainly, long-range planning will become more necessary.

plans within the category of feasibility, so that management may shape up a prospective to aid in balancing operations and in reaching the future goal successfully.

Planning the Objective

The question of - where are we headed! - should consider the desires of both management and stockholders. Few businesses today can continue very long on a basis of status quo. To attempt merely a maintaining of existing position would probably result mostly in decadency. One must progress along with technological advances or fall by the wayside. In a continuously expanding market, public acceptance diminishes unless volume objectives and marketing methods are liberal. Of course this forces additional needs for manpower and capital, and these needs are intensified when management sets its sights on attainment of differential growth.

Forecasting the Future

The desired objectives may be planned properly only after full appraisal of probable future events. It would be futile to attempt developing a long term objective if accurate, unconditional forecasts were prime factors. While such high quality estimates are virtually impossible, valid scientific observation about the nature of relationships can be made. It should not be necessary to include a large number of separate appraisal factors, as many might be unimportant or might balance out each other. Therefore, a relatively few essential factors should be enough to provide rational conclusions. Of course forecasting must acknowledge the fact that new elements will make their appearance and old elements will change, so that these conditions must be weighed in utilizing past data and projecting them into the future. Some of the more important basic data include demand, supply and price, as well as changing conditions in population, productivity, purchasing power, governmental influence and improved techniques.

All of these kinds of studies should lead to a projection of a feasible program, taking into consideration optimum growth attainable with efficient use of available manpower and capital.

Making the Plan Work

Once the desired program has been established, it should be very helpful in simplifying daily decisions. Consistency is of the utmost importance in carrying out the program. It seems entirely fruitless to plan a Five-Year Program and then to ignore the remainder term after the lapse of a year or less. If the long range policies are sound they should serve as bases for proper financing and overall planning and need not be varied materially unless required by major changes. Of course there will be peaks and valleys occurring within the five years and the goal may need modification; but with key employees properly alerted, current operations can be related to the longrange plans, to which annual budgets may also be keyed.

Profit Control

It is quite essential to have proper control of all phases of the program. Naturally the main theme of business is profit, so that volumes, prices and expenditures should be fused into this common objective. It is often found that meticulous care is taken in relation to control of outgo, perhaps with inadequate analysis of the revenue which may be generated by the expenditures. Therefore, a complete overall objective profit analysis is essential, not only to measure current progress but also to indicate those weak points which need correcting and to select the strong factors which can be maximized to increase profits.

TRAVEL EXPENSE

(Continued from page 11)

4th line management	7	8%	3	3%
5th line management	17	18%	4	4%
No Policy	9	10%	10	11%

In companies where 4th and 5th line management was the last approval required, it was generally indicated that the policy merely required approval of the next highest authority to the party entertaining.

21 companies or 23% required written receipts for entertainment expense while 71 or 77% did not.

Part III - On Miscellaneous Policies

	Yes	%	No	%
Do you have a published travel policy?	55	60%	37	40%
Do you issue printed travel instructions to each traveler?	16	18%	76	82%
*Do you require travelers to secure an advance?	22	24%	70	76%
Are company auditors allowed to challenge expenses after executive approval? (2 indicated No Policy)	69	75%	21	23%

* Of the 70 companies reporting that travelers were not required to secure an advance, 25 companies indicated it was optional with the traveler.

In this area some of the noted remarks were quite amusing, such as, "Certainly, the auditor can challenge the expense, but what good will it do him" and, "It all depends whose expense account is being challenged".

Part IV Methods of Reimbursement and Items of Cost Allowed

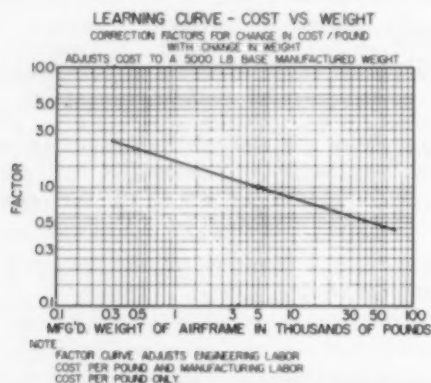
	No.	Yes %	No No.	No %	No Policy No.	No Policy %
Are living expenses paid or fixed per diem?	15	16%	77	84%	-	-
Are living expenses paid on actual cost?	77	84%	15	16%		
If on actual cost basis do you have set maximums for various expenses?	16	18%	61	66%	15	16%
(1) If on fixed per diem do you reimburse for excess expenditures where properly substantiated?	24	26%	8	9%	60	65%
(2) Do you allow travelers to call home at company expense to report:						
Change in Plans	77	84%	11	12%	4	4%
Check on family events	44	48%	44	48%	4	4%
(3) Do you allow laundry:						
After 1st day:	13	14%				
2nd day:	8	9%				
4th day:	16	17%				
Other	36	39%				
Not allowed in any instance			8	9%	11	12%

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THE LEARNING CURVE THEORY

(Continued from page 7)

on linear graph paper was also hyperbolic in shape.
Fig. 8



Another interesting use for Learning Curves is shown on Figure 8. It has been recognized for some time that per pound costs of aircraft are affected by size, measured as manufactured weight of the airplane. Some of the more important reasons for this variation are:

1. The number of parts does not increase in proportion

TRAVEL EXPENSE

(Continued from page 17)

(1) Some apparently interpreted this question to mean, would you reimburse travelers for what appeared to be excessive actual expenses if they could substantiate them and answered yes, since only 15 companies reported paying on a per diem basis.

(2) Several companies based the allowance of these costs on reasonableness and necessity and some permitted use of company communication lines or collect calls to the company offices from which such messages would be relayed home.

(3) Several companies indicated allowance of these costs based on reasonableness and necessity.

Companies surveyed were asked to comment on meal allowances and per diem:

Which of the following do you consider to be adequate for meals in any locale.

	No.	%
\$4.00 to \$5.00 per day	6	6%
\$6.00 to \$7.00 " "	41	45%
\$7.00 to \$8.00 " "	29	31%
\$9.00 to \$12.00 " "	8	9%
No opinion	8	9%

If on fixed per diem rates, what rate is allowed: 15 firms paid per diem.

- 1st line management 7 firms paid actual expenses — rates ranged from \$10 to \$18 per diem
- 2nd line management 2 firms paid actual expenses — rates ranged from \$10 to \$15 per diem
- 3rd line management 1 firms paid actual expenses — rates ranged from \$10 to \$14 per diem
- 4th line management 0 firms paid actual expenses — rates ranged from \$9 to \$15 per diem
- 5th line management 0 firms paid actual expenses — rates ranged from \$0 to \$13 per diem

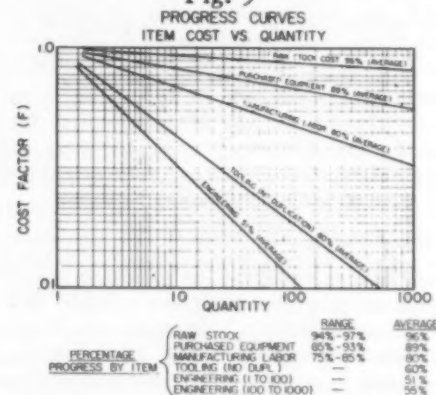
In this area 3 firms paid \$6 to \$7 a day plus hotel and transportation. 6 firms paid varying rates of per diem but at the same rate to all levels of management. 2 firms stated that the rate of per diem varied with locale rather than level of management and used the size of the city to determine rates, and 2 firms had fixed rates for various management levels, a stated amount of which was to cover hotel. If the traveler was required to pay more than the stated sum for hotel accommodations and produced receipts, he could be reimbursed for the excess hotel costs in addition to his per diem allowance.

In conclusion, we feel that travel and entertainment expense can and should be a budgeted item and we will continue to strive toward better controls. We feel that this survey is very enlightening and has already given us some new ideas in facing the travel expense problem. Maybe these findings will help you.

to the weight increase.

2. There are less parts of minimum size and gauge in a larger airplane.
3. A large airplane has a greater spread of such items as crew, electronics, hydraulic systems and components, fuel systems, and other equipment.
4. A large airplane generally provides better access to parts and equipment than a smaller aircraft.

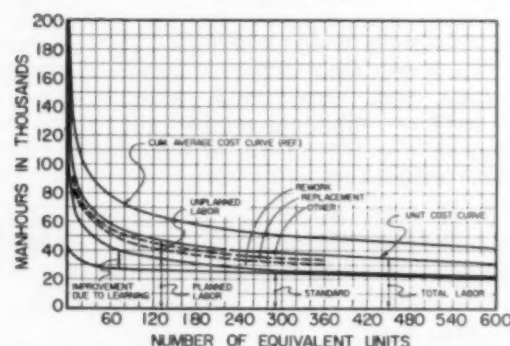
Fig. 9



While determining the trend effect of these items, again a hyperbolic tendency was observed. When plotted, on logarithmic graph paper, it resulted in the very useful progress curve shown on Figure 8.

Fig. 10

ANALYSIS OF LEARNING AS COMPARED TO STANDARD



There are many other practical applications of Learning Curves. Once the trends have been established by putting historical data in the mathematic expressions discussed above, they can be used in formula, chart, or slide rule form for estimating labor costs for submitted bids, forecasting shop labor loads, planning manpower needs, scheduling work flow and many other purposes. Another important use particularly for the Learning Curve of labor costs during a given production quantity is that of a running guide as to the comparison of actual performance to locate and correct the causes of malperformance when they occur rather than when the production run is completed and the money has been lost.

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EQUITABLE SELLING PRICE

(Continued from page 10)

as the distribution of normal burden. For example, if the burden of the power house is distributed on the basis of kilowatt hours, the investment in the power house should be distributed on the same basis.

- (8) After the distribution of the investment in the service burden centers has been completed, all of the investment will be in the productive or operating burden centers.
- (9) The investment in each productive burden center will be multiplied by the profit percentage explained in (5) above and an annual normal amount of profit will be obtained for each productive burden center.
- (10) The normal annual profit for each burden center will then be divided by the annual units used in expressing the normal burden rate. This may be machine hours, man hours or some other appropriate unit. The result will be a normal profit per machine hour or per man hour or whatever other unit is used as a basis for the normal burden rate.
- (11) From the above data, all that is now required is to know the production per man hour or per machine hour to determine the profit factor for each product by operation.
- (12) The computed selling price for each product will be determined from the following factors:

Normal unit manufacturing cost	xxxx
Profit factors per unit for each operation	xxxx
Commercial expense - to be applied as explained below	xxxx
Selling Price	xxxx

Applying Commercial Expenses

There is no general rule for stating how Commercial Expense should be applied to individual products. These costs should be applied only after a thorough study has been made of the costs of distribution and marketing and appropriate bases should then be adopted as a result of these studies.

Adoption of the method suggested above for determining selling prices will result in relatively equitable prices for the various products manufactured since each product will be priced so that the profit return will be the same per dollar of investment.

There is nothing new in respect to the method outlined above. Many of us will remember the debates of twenty-five or thirty years ago when many cost accounting systems were installed with interest on investment as an element of cost. Its purpose was to reflect in costs the investment required for the manufacture of each product so that selling prices would yield an adequate return on investment. One of the principal objections to the plan was the inclusion of a profit element in costs with the result that it became a part of the inventory valuation and its elimination from inventory for tax purposes was necessary. The method suggested in this article accomplishes the same objective but it is treated as a

separate calculation and does not become a part of costs or inventory valuation or enter into accounting entries.

To a great extent, method (3) is analogous to the techniques that apply in capital expenditure budgeting. In budgeting capital expenditures, a criterion is established for an acceptable return on investment and investments are ranked in accordance with their calculated rate of return. Certainly, the selling price of items manufactured from the use of these capital investments should be computed in such a manner as to yield a planned profit which will be a planned return on the investment.

The Part Played by Budgeting

One of the first questions that arises is the part to be taken by the budgeteer in connection with the setting of selling prices. In a free economy, prices will always be determined by competition and if a company wants to continue to market its products, it must meet the selling prices of its competitors. However, the budgeteer can perform a very worth-while function by calculating appropriate selling prices for all products. These selling prices should be compared with the selling prices currently being charged and the subject should be discussed with Management and with the Sales Department and a comparison of computed selling prices and actual selling prices should be furnished to the Sales Department.

Whenever feasible, the computed selling prices should be adopted. This is especially true in the case of new products. However, caution is required in this respect because a drastic change in prices may change the character of a company's business and result in idleness of some equipment and the necessity for investment in other types of equipment. This is another indication of the tie-in that should exist between selling price determination and return on capital expenditures.

Possibly, the greatest use of selling prices computed to return a definite yield on investment is for study of the product line. It may be advisable to prune the product line of items that indicate a low rate of return and require a large capital investment. Conversely, there may be other items where the return is exceedingly high and a decrease in selling price may result in capturing a larger share of the market with a consequent improvement in the total profit picture.

A knowledge of the profit return for all products in the company's line in terms of the investment required should be a potent factor in determining future plans in respect to acquisition of capital assets for both expansion of existing products and the manufacture of new products.

Management techniques need to be emphasized and re-emphasized. The need for teaching and promulgating sound business principles never ceases. These techniques are responsible for the high standard of living in this country. Teaching results in ever-increasing adoption and this procedure gradually decreases economic waste.

It is believed that selling price determination is a fertile field and that the adoption of improved techniques will result in a decrease in some of the ruinous price competition that is presently prevalent in industry.

ANOTHER GREAT NATIONAL CONFERENCE PRESENTED BY N.S.B.B. IN CLEVELAND, OHIO

By: L. P. Haverkamp
Budget Director, Trailmobile Inc., Cincinnati, Ohio
(Member, Editorial Staff, "Business Budgeting" Magazine)

Largest attendance on record enjoys one of the best yet; technical sessions prove to be a big hit, as was the well-rounded program of talks and luncheons; new officers named at annual business meeting; the N.S.B.B. looks ahead with confidence!

Described as "the best ever", the 1956 National Conference of the National Society for Business Budgeting, held in Cleveland in May, is now history; lingering in the minds of those who attended is the memory of a most pleasant and most profitable visit to Cleveland.

that the Budget Director could be of great assistance to the program. Constant reappraisal and planning is required for effective organizational control for a growing and dynamic company.

CONVENTION REPORT

The following is a series of brief notes which I hope will serve as a whetting of the appetites of all members - those who attended and those who could not - for the full text of the excellent talks and discussions at the 1956 National Convention at Cleveland, Ohio. The full text will be printed in the next issue of Business Budgeting along with biographical sketches of each speaker.

The theme of the convention program seemed to be wrapped-up in a statement made by J. P. Long, Chairman of the opening session, when he said that "Planned profits are not a fad." Mr. Long used this statement by way of introduction to the subject of "Organization for Profit" which was to be discussed by Mr. Henry Spitzhoff, Vice-President, Robert Heller and Associates, Inc. and Mr. Warren Guthrie, News Commentator and Chairman, Speech Department, Western Reserve University.

HENRY W. SPITZHOFF

Mr. Spitzhoff discussed the position of "Effective Organization" in the important problem of profit planning.

The base for all organizational planning is -

1. Structure
2. People

There are really not two separate points, but must be merged to accomplish the objectives and benefits inherent in solid organizational planning. No universal answer is available for an organizational structure which will suit all operations - size, scope and objectives lend variance to structures, but no business should be without one. Organization planning must also remain fluid to keep pace with growth or changing conditions within a company.

The first step in establishing an effective organization plan is to analyze the corporate goals. Then establish a focal point of responsibility for the development of the organizational structure.

The necessary tools are -

- 1 - Charts of organization
- 2 - Position descriptions
- 3 - Position specifications of duties and qualifications

A personnel development program in a growing company to meet the needs of the future was stressed as an important adjunct of a organizational structure. Mr. Spitzhoff discussed the role that the Budget Director should play in the establishment of a good organization. He did not necessarily recommend that this be one of the Budget Directors duties, but he did express the opinion



W. D. (Bill) McGuire

The cameraman catches our new national president in a pleasant mood, in a position becoming quite familiar to this popular N.S.B.B. veteran - behind the rostrum. Mr. McGuire is much sought after as a speaker, not only by N.S.B.B. chapters, but by other organizations as well. He has been active in N.S.B.B. for several years, and in the coming year will devote additional enthusiasm towards building the organization he has served so well. (Photo courtesy Chas. Manteuffel, Louisville Chapter N.S.B.B.)

WARREN A. GUTHRIE

A familiar voice to Ohioans, that of Warren Guthrie, the Sohio News Reporter, greeted the audience from the speakers rostrum as the next discussion leader. Mr. Guthrie is also Dr. Guthrie, Chairman of the Speech Department of Western Reserve University and his subject was "Effective Communications." A most appropriate subject for both the Mister and the Doctor.

Dr. Guthrie explained that our ability to communicate with each other is affected by the fact that all people come from different worlds and backgrounds.

He then reviewed a brief history of communications. Prior to the year 1500, the world lived in a speaking and listening world, but, with the advent of the printing press, the world then transformed into a reading and writing world. The latter situation is responsible for the

present society, but in recent years, there has been detected a definite shift back to a speaking and listening world.

The first step in the reversal was pinpointed at the time of the development of the telephone. Dr. Guthrie asked the group to conceive, if they could, how they could control a modern aft-flung business without the telephone.

This places a heavier burden on being sure of what we say. Dr. Guthrie pointed out that, what we say and what is understood by the other person can be very different. He asked that we become better students of language and increase our skill in its use.

Along with the development of expressing oneself, should also come a development in our capacity to listen.

For comparison purposes, Dr. Guthrie, pointed out that all the written words in the world will not be of any value until people do something further with them, but when we listen, even though, not well, we must learn something.

Both the written and spoken word is necessary in this modern world to fully convey our thoughts. The spoken word for fuller understanding, and the written for record purposes and posterity.

I think it was Mr. Guthrie instead of Dr. Guthrie that suggested that we try it out on our wives - next time she talks to you, really listen, give her an answer, contribute to the conversation, and then she knows that you have listened to her spoken word.

If everyone would really listen to what is being said to them, we would all learn a lot more.

LUNCHEON SPEAKER

You will notice that this article is not headed-up with the speaker's name. It seems that there was a bit of confusion about who was addressing us after the Thursday luncheon. The speaker was introduced as Dr. Henry Barton of the Atomic Energy Commission. In the introduction it was explained that he was going to discuss the manner in which atomic energy was to affect our future lives.

After about the first three minutes, "Dr. Henry Barton" dispelled the gloom that had settled on the guests, caused by being faced, as it appeared, with a serious talk as an after-dinner speech, and launched into one of the most entertaining sessions of the convention. To illustrate some of his remarks, he presented a series of charts which were classics in their nothingness.

It turned out that the speaker actually was Mr. Henry Pildner, music director of WGAR, Cleveland. To show that his actual title was not a misnomer, he played two piano solos, ala Victor Borge, which were excellent. No question about it - a very entertaining guy.

THURSDAY AFTERNOON SESSIONS

Since the afternoon sessions were devoted to concurrent discussions of function topics, it will be impossible to report on each of them. From opinions expressed at the conclusion of the sessions, it appeared that the Cleveland Chapter had arranged a set of excellent topics which led to lively discussion. Most of the sessions had to be called-off due to lack of time, rather than to lack of interest.

I had the privilege of attending the session led by Charles Eckelkamp, newly-elected national vice-president. The topic of the session was "Gaining Acceptance of the Budgeting Plan," and certainly time ran out on us

with the discussion still going strong.

The original selling of a budget system was discussed, and it appeared that even with top man backing, the establishment of a budget system still has a terrific job of selling to be done down the line before it can be said that the budget has gained acceptance. Actual experiences of several members were related and discussed.

One of the points in the discussion on which there seemed to be universal agreement is that, in order to have effective budgetary control, the top man in the organization, not the second, third or fourth, but the top man must be sold on operating by budgetary control. Anything less than the top man lessens the effectiveness of the system.

Most of the group stated that through regularly scheduled meetings with department heads the status of the budget idea grew in effectiveness.

PANEL DISCUSSION

The Friday morning session was devoted to a panel discussion manned by excellent speakers, and covered the subject "Developing and Measuring Profit Objectives."

CLARENCE NICKERSON

The first speaker discussed the topic from what he stated was an academic viewpoint - he being a professor at the Harvard Business School - but obviously, after reviewing his approach, his industrial experience also revealed itself.

The following paragraphs are merely excerpts from his talk and are not intended to be all inclusive, nor do they explain in detail the speakers further development of each of these statements.

"Profit serves as the common denominator combining all the aims of the Sales, Manufacturing and Finance Departments of a company.

Planning of profit, therefore, centers the activity of all departments toward one objective, and prevents over-emphasis on any one phase of the operation.

How are objectives to be judged?

- 1 - Past performance
- 2 - Budgeted Profit
- 3 - Competitor's Profit
- 4 - Percent of Sales
- 5 - Profit per Man Hour or Machine Hour
- 6 - Return on Investment

Return on investment is a fair measurement despite some arguments to the contrary, as long as each segment of a business is measured against the same objectives it is fair to all.

Meeting the established return on investment may stymie risk taking for greater profits. Meeting the goals sets up a complacency attitude which must be guarded against.

Analysis of return on investment should be made in depth. Do not stop at the simple percentage figures. The "why" of variance is extremely important.

Professor Nickerson's most controversial statement was to the effect that the president of a company should wait for the information as to overall profits, and we should take care of the lower echelons of the business first. (But we like to work here, Professor!)

WALLACE BOOTH

Mr. Booth, who is Manager of the Profit Analysis Department of the Ford Motor Company, promptly had the lights turned off as soon as he was introduced, and

I wasn't prepared for the emergency, so my notes are few, but my admiration for the Ford system of profit control did not suffer from lack of electricity. Mr. Booth supplied the illumination of the subject matter.

By means of slides the subject of profit control at Ford was explained in detail with the opening slide setting the scenes for the discussion. This slide showed, as best I recall, the following points.

- 1 - Organizing for Profit Control
- 2 - Setting Objectives
- 3 - Short Term Planning
- 4 - Long Term Planning
- 5 - Measuring Techniques

The speaker discussed each of the above points in detail and supplemented his talk with additional charts and graphs elaborating on the specific topics.

The comparative base for measuring results of the various Ford Motor Company divisions is the return on assets employed.

Mr. Booth stressed that they pay only minor attention to the past, but make good use of the year-to-date actual performance, and the coming four months budget.

One of the more important aspects of their planning seems to center about the plans of the operating personnel to accomplish the total company objectives. A five year profit plan, complete with details as to specific projects, serves as a basis for all operating improvements.

FREDERICK MUTH

Mr. Muth continued to stress the predominate thought of the convention - planning for profit. At the Armstrong Cork Company, they also use the return on investment theory of measuring product lines and divisions. Specific goals and personal responsibility are clearly set forth as objectives. These are both long and short terms.

The speaker pointed out that if profit objectives are to be achieved, there must be a continual, comprehensive reporting system available for reporting actual performance versus objectives.

JOSEPH POWELL, JR.

The Friday luncheon speaker compared to Thursday's was a considerably different type of person, and with a considerably different theme - but no less interesting. Mergers and diversifications were discussed by Joseph Powell, Jr., V. P. Finance, Harris-Seybold Company.

Mr. Powell reviewed the various reasons for mergers. In his opinion, the reasons are divided into defensive and offensive categories. A list but by no means complete, follows, and elaboration on each reason will have to be obtained through reading the later publication of his entire talk.

Defensive

Unsatisfactory product - declining markets
Tax carry-forward
Expiring patents

Offensive

Growth for growth's sake - size
Seasonal products
Diversifications as insurance for demand fall-offs
Better growth potential
Use of capital - excess cash
Glamour for stock attractiveness
Stimulation to organization
Additional facilities or personnel
Bargains

In discussing a merger program Mr. Powell stated that merger action requires active participation of the

NSBB BOARD MEMBERS HEAR REPORTS ON YEAR'S PROGRESS AT SEMI-ANNUAL MEETING

Growth of organization charted, to soon reach 1,000 members; various committee reports are presented.

On May 23rd - the day before the convening of the National Conference -- the national officers and directors held their semi-annual meeting, and put in a full 9-to-5 day, discussing what happened, and what is planned to happen regarding our national organization.

The meeting was attended by 34 members, all of whom were national officers or directors, chapter presidents, chapter presidents-elect or members of special committees.

One of the number of interesting reports submitted throughout the day was the report by Visch Millar, national secretary. Visch had charts, as a good budget man would, to illustrate the where-we-are and whither-are-we-going aspects of our organization.

The total membership as of May 17, 1956 was reported as 647 with almost a daily fluctuation. Based on the known increases, due to newly-formed chapters, the total membership as of the close of the fiscal year was forecast at 700. This compares to 505 members at the beginning of the year.

Visch also presented charts to show the probable growth of our organization on the national scale. He offered a choice as to which curve we thought best exemplified our growth - one indicated a membership of 1,000 by 1960, and the other 1,000 by 1958. The latter was developed on the basis of the last two years growth, whereas the former showed the trend line dating back to 1951.

One of the important items on the agenda for the day was the proposal by national president E. "Buck" Mauck, to formally accept the applications for chapter charters from the cities of, Detroit, San Francisco, and San Diego. With these Chapters in the fold, we have had a 50% growth in the number of chapters in one year - 12 to begin the 1955-56 year with, and 18 to close it out. Hal Mason, Chairman of the Chapter Formation Committee, reported that this was the culmination of many hours of work by his committee and that the future growth will be just as spectacular.

Reports from other committees, such as, Publications, Research, National Conferences, Elections and Reports from Chapter Presidents on special chapter activities consumed the balance of the day. Brief summaries of

president of the organization. Other points he developed are briefly stated as follows -

- 1 - Define areas of interest
- 2 - Define size of business
- 3 - Hunt for opportunities
- 4 - Investigate - Take your time
- 5 - Preliminary negotiations

ELLIOT JANEWAY

In the case of the final speaker on the convention program, I must admit an inability to reduce Mr. Janeway's talk to a short synopsis, and to avoid a possible misinterpretation of his remarks, you will probably be served better by waiting for the printing of the full text.

There can be no mistake though, concerning Mr. Janeway's sincere argument and disagreement with the monetary policies advanced by the Federal Reserve Technical staff.

the preceding reports follow.

Publications

A review of the Business Budgeting publication for the year was presented by Larry Haverkamp, Business Manager, in the absence of Glenn Blair, Editor, and plans for an expanded and better national publication were discussed. All chapter presidents were instructed to appoint a Publications Chairman whose duty it will be to act as the contact of the chapter with the editor of Business Budgeting. It is to be his responsibility to obtain the articles necessary to meet the chapter's issue responsibility. Three chapters were assigned for each of the six issues planned for 1956-57. At present we are printing and distributing 800 copies of each issue of Business Budgeting.

Research

Joe Grimm reported for Duane Borst, who was temporarily snowed-under with family illness, on the text book project. A survey was conducted of the Business Administration schools in the U.S.A. to determine the requirements for a text book on budgeting. Joe quoted many letters from college and university professors expressing a keen interest in the project. The progress and problems were reviewed and an outline of the proposed chapters of the book was distributed to the chapter presidents, and they were asked for contributions from members on any of the chapter topics. The contributions will be edited by the committee and Dr. W. D. Knight of the University of Wisconsin. Dr. Knight is serving in an advisory capacity on the project.

Election

The following officers were nominated by the committee and elected by the members to serve as national officers and directors, for the 1956-57 term.

Name	Chapter	Office
W. D. McGuire	Milwaukee	President
C. Eckelkamp	New York	Vice-President
M. Aichholz	Cincinnati	Secretary
W. Campbell	Dallas	Treasurer
V. Millar	Philadelphia	Director - 3 yr. term
D. Bacon	Chicago	Director - 3 yr. term

National Conventions

Sixth	-	1956	Cleveland	-	May 23 & 24
Seventh	-	1957	Chicago	-	May 23 & 24
Eighth	-	1958	New York	-	Late in May
Ninth	-	1959	?	-	

Bids for the sponsorship of the 1959 national convention were presented by the Cincinnati, Louisville, Twin-Cities and Milwaukee chapters. Decision on this matter was postponed to the September board meeting.

Chapter Activity

Walter Moore, president-elect Cincinnati Chapter, explained his chapters program of furthering the society's aims of co-operation with educational institutions by explaining the details of a joint meeting with the faculty and students of the three universities in his area. The meeting was held at one of the universities with chapter members serving as panel members discussing, on broad terms, the Budget Director and his duties. The affair was a dinner meeting with the members underwriting the cost of the students and faculty members meals. It is expected to make this an annual affair on a rotating basis.

Walter Knobe, President-Milwaukee Chapter, gave a full report on a meeting they hold each year at Madison, Wisconsin, the home of the University of Wisconsin. Guests from the university staff, the University School of Commerce, certain state officials and from industries in the Madison area were invited in addition to approximately 30 students. Walter reported fine co-operation and excellent publicity resulting from these meetings.

These two chapters have adopted a program which may be well to consider for all chapters.

NEW MEMBERS

HARRIS J. HOAG, Planning Director, Allstate Insurance Co., Skokie, Illinois
HAROLD J. SHEAR, Budget Director, The Toni Co. Div. of Gillette Co., Chicago, Ill.
GEORGE J. SLAVICEK, Budget Director, Ekco Products Co., Des Plaines, Ill.
DERRILL J. DAVIS, Comptroller's Staff, Republic Steel Corp., Cleveland, Ohio
CHARLES J. KRAVEN, Manager Financial and Statistical Division, Republic Steel Corp., Cleveland, Ohio
RICHARD A. WEBSTER, Assistant to the Treasurer, True Temper Corp., Shaker Heights, Ohio
HARRY D. FLEISCHER, Factory General Accountant, The Toni Co. Div. of Gillette Co., St. Paul, Minn.
JOHN P. WEINARD, Accountant, Minneapolis, Minn.
RUDOLPH HACKL, Budget Supervisor, The Nestle Co., Inc., White Plains, N. Y.
ERWIN M. STERN, Department Head, Bristol Laboratories Inc., N. Syracuse, N. Y.
EDWARD L. ALM, Methods Analyst, Gordon E. Wilson CPA, Indianapolis, Ind.
ROBERT G. HAMILTON, Division Controller, Seaboard Oil Co., Dallas, Texas.
OWEN L. HILL, Treasurer, Seaboard Oil Co., Dallas, Texas.
BREMER EHRLER, Chief Accountant, U.S. Post Office Department, Louisville, Ky.
DANIEL J. CONLIN, Budget Accountant, Eli Lilly and Co., Indianapolis, Ind.
J. H. O'CONNELL, Manager of Budgets, Pillsbury Mills, Inc., Minneapolis, Minn.
LEONARD J. LOZINSKI, Assistant Controller and Manager of Cost Dept., American Hoist and Derrick Co., St. Paul, Minn.
HAROLD J. WOEHRMYER, Assistant Secretary, Cincinnati Gas & Electric Co., Cincinnati, Ohio
G. WILLIAM SHOUDY, Assistant Manager Accounting Dept., Mutual Benefit Life Insurance Co., Newark, N.J.
ROBERT C. VONSO THEN, Accounting Analysis Supervisor, New Jersey Bell Telephone Co., Newark, N.J.
ELLSWORTH T. WADE, Budget Manager, Blatz Brewing Co., Milwaukee, Wisc.
RALPH B. BARTLETT, Triangle Publications Inc., Philadelphia, Penna.
LEWIS A. G. MORTORANO, Management Accounting Supervisor, Lybrand-Ross Bros. & Montgomery, Bryn Mawr, Penna.
MISS FLORIDA I. HEINEMAN, Expense Control Manager, Dayton's, Minneapolis, Minn.
JOHN F. HOFSTETTER, M. F. Patterson Dental Supply Co., St. Paul, Minn.
CORTIS N. RICE JR., Operations Controller, Northern States Power Co., Minneapolis, Minn.
DELMAR O. TOWNSEND, Controller, Van Huffel Tube Corp., Warren, Ohio
RICHARD L. CRIST, Accountant, Bear Manufacturing Co., Moline, Ills.

TWO NEWEST CHAPTERS OF NSBB HOLD FIRST MEETINGS IN JUNE

Detroit Chapter underway, with large list of charter members; San Diego receives charter also.

The new Chapter of N.S.B.B. in Detroit, Michigan, held its first meeting on June 4, with a large attendance; this chapter has one of the largest list of charter members of any chapter, twenty-two in all. Everett Yount and Hal C. Mason, of the Chapter Formation committee, worked with Leroy C. Kamin, Allstate Insurance Co., Detroit, in getting the Detroit group under way.

The charter members of this chapter are; James M. Carl, supervisor cost analysis dept., Burroughs Corp., Detroit; Henry M. DeMeyer, manager budget and general accounting depts., Continental Div. of Ford Motor Corp.; J. K. Dever, supervisor of forecasts, American Motors Corp.; Roman Dodyk, budget manager Sickers Div. of Sperry Rand Corp.; Paul Ceffer Jr., budget director, Holley Carburetor Co.; Eric E. Hagberg Jr., budget director, Shwayder Brothers Inc.; Anthony A. Kasper, controller, Square D. Co.; Bernard W. Koski, budget supervisor, Square D. Co.; Eugene T. May, budget controller, J. I. Hudson Co.; Charles J. McClain, controller, Burroughs Corp.; George S. Patrick, senior budget accountant, Parke-Davis & Co.; Theodore P. Palli, chief accountant, Micromatic Hone

H. T. DICK, Budget Assistant, Chas. Pfizer & Co., Brooklyn, N.Y.

CHARLES A. COX, Comptroller, Acme-Goodrich Inc., Indianapolis, Ind.

PERRY E. WILGUS, Cost Analyst, Bell Fibre Products Corp., Marion, Indiana

A. F. JOHANNSEN, Controller and Assistant Treasurer, Archer Daniel Midland Co., Minneapolis, Minn.

RICHARD S. PERRY, Controller, Schaefer Inc., Minneapolis, Minn.

M. A. BERNARDI, Chief Accountant, The Liquid Carbonic Corp., Chicago, Ills.

ERNEST H. WEINWURM, Associate Professor, De Paul University, Chicago, Ills.

A. L. HARWELL, Anderson Electric Corp., Birmingham, Alabama

ARTHUR J. BAKER, Assistant Controller, Investors Diversified Services Inc., Minneapolis, Minn.

HARRIS E. DOEPKE, Chief Budget and Cost Accountant, Investors Diversified Services Inc., Minneapolis, Minn.

JAMES W. LUNDBERG, Senior Budget Accountant, Investors Diversified Services, Inc., Minneapolis, Minn.

FRANK J. JUSTICH, Budget Manager, Olin Mathieson Chemical Corp., Brooklyn, N. Y.

JOSEPH J. KERVIN, Plant Controller, A.O. Smith Corp., St. Louis, Mo.

EDWIN R. VAUGHAN, Budgetary Planning and Control, Cockshutt Farm Equipment Ltd., Brantford, Ontario, Canada

JOHN A. JANSMA, Manager Administrative Budget Dept. Lincoln Division Ford Motor Co., Dearborn, Michigan.

GEORGE F. ZIMMERMAN, Assistant to the Treasurer, Ortho Pharmaceutical Corp., Raritan, N.J.

ALBERT G. JACOBS, Assistant Treasurer, Nukem Products Corp., Buffalo, N.Y.

CHARLES C. TERWILLIGER, Supervisor of Budgets, Carton & Container Div. of General Foods Corp., Battle Creek, Mich.

EDWARD C. SPATZ, Supervisor of Manufacturing Costs and Budgets, Cadillac Motor Car Div. of General Motors, Cleveland, Ohio

C. CLIFFORD MARKS, Assistant Comptroller, Crane Co., Chicago, Ill.

Corp.; Eugene L. Shark, manager budgets, Wyandotte Chemicals Corp.; Edward A. Taub, vice-president, Manufacturers National Bank; Carrett C. Van de Riet, controller and assistant treasurer, Detres Chemical Industries; Henry H. Wallstrom, assistant controller, the J. I. Hudson Co.; John F. Warren, assistant controller, Mardigian Corp.; Leonard Determeyer, Ford Motor Co.; John R. Hurnung; John A. Jansma, Lincoln Div. of Ford Motor Co.; LeRoy C. Kamin, Allstate Insurance Co.; and J. W. Korth, Ford Motor Company.

This group received its charter at Cleveland in May, and is now all ready to take its place as a full-fledged N.S.B.B. chapter. More news about this group in later issues.

Another chapter to receive its charter at Cleveland was San Diego, and this group had its first meeting as a chartered chapter on June 5. This group was organized by Ross D. Stevens, Solar Aircraft Co., with the aid of the Chapter Formation committee.

There are twenty-one charter members of this group: Lester J. Adams, budget coordinator, Convair Div. of General Dynamics Corp.; Benjamin B. Bergman, assistant comptroller, U. S. Naval Repair Facility; William K. Clay, accountant, Ryan Aeronautical Co.; Robert A. Corder, chief cost accountant, Bill Jack Scientific Instrument Co.; John J. Curley Jr., budget coordinator, Convair Div. of General Dynamics Corp.; Nicholas J. Doukas; William M. Fischer, budget analyst, Ryan Aeronautical Co.; James R. Herbig, manager budget department, Convair Div. of General Dynamics Corp.; Frank A. Kelleher, budget and forecast analyst, Solar Aircraft Co.; Ross G. Kinsburg, partner Haskins & Sells; Jos. Robert Lannom, budget analyst, Solar Aircraft Co.; Joseph F. LeFebvre; J. M. Maurer, executive Assistant, Ryan Aeronautical Co.; Edward H. Morley, budget analyst, Ryan Aeronautical Co.; J. E. Peterson, controller and budget director, Community Chest of San Diego; Robert J. Schier, staff assistant to Budget Manager, Convair Div. of General Dynamics Corp.; Grover C. Snyder Jr., supervisor plant budgets, Solar Aircraft Co.; Ross D. Stevens, staff accountant, Solar Aircraft Co.; William V. Thorpe, staff accountant, Solar Aircraft Co.; Rolfe Wyer; and Howard E. Vanderbilt, budget analyst, Convair Div. of General Dynamics Corp.

We expect great things of these new chapters - welcome into the fold!

LETTERS TO THE EDITOR

Editor, Business Budgeting:

We here at Illinois Tool Works are having growing pains. In recent years we have gone through a program of divisionalizing and decentralizing. Our chart of accounts has become inadequate and inflexible enough to meet our needs.

We have three operating divisions and must tailor our accounts to be usable by each of them (and possibly additional ones), as well as have the ease of consolidation.

This program is presently under study and must be completed by early fall.

Would you be so kind as to put a short note in the next "Business Budgeting Magazine" so that anyone who has a similar organizational set-up can be of assistance to me? If possible, and does not violate their company policy, I would appreciate a copy of their chart of accounts.

(A. G. Avant) Chief Accountant, Illinois Tool Works
2501 No. Keeler Ave., Chicago 39, Ill.

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